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Welding Ford Rear Axles

Electrical Resistance or Flash Welding Utilized to Make Light, Strong Axle Housing of Steel Sheet, Structural Channel and a Forging

BY FAY LEONE FAUROTE*

A NEW method of assembly has been introduced by the Ford Motor Co. in the manufacture of the Model A—a process of mechanical integration which will go far as soon as its value is recognized by other automobile manufacturers. This is electric welding, not for minor jobs and for petty parts, but for major operations on the motor car. Welding has, indeed, caused the advent of a new day in motor fabrication, a new and surer way of assembly, a method of building up several parts into a unified whole; no later loosening can possibly occur—the assembly is all one piece. A press produces a perfect stamping, the drop forge a perfect forging. There is an initial adjustment or two in a welding machine, pressure, a throw of the switch, a flash, an upset and a weld and lo! the job is done—a permanent combination of metal of finer form and greater strength and at a greater rate of production.

There are 1339 welding operations on the new Model A; 845 of them are spot welding, the rest are electrical resistance flash welds, arc welds and seam welds, with electric resistance flash welding leading in importance and speed. There are on the wheels 61 welds each, brakes 32 welds each, tire carrier two welds, bumper two welds, rear axle housing eight welds, differential housing two welds, radius rod four welds, torque tube two welds, muffler 37 welds, steering wheel four welds, battery support eight welds, equalizer rod one weld, foot pedals two welds, accelerator one weld, starter shaft one weld, breather pipe four welds, fan pulley 22 welds, radiator rod four welds, tie rod two welds, oil pan 23 welds, oil pump one arc weld, gas tank 28 welds, equalizer shaft four welds, body 16 welds. The several examples just given show the wide distribution of the process throughout the chassis, body and accessories.

Electric welding has been adopted only after much experimentation. Welding is the cheapest method of assembly known when using current at any reasonable cost. There is a half million horsepower available at Fordson. This power is being produced under ideal conditions and at a low price. The wide uses of electric welding and electric furnaces, therefore, are natural concomitants of this condition.

Electric resistance flash welding, as used quite widely by the Ford Motor Co., gives a joint which is clean, strong and mechanically well suited for the assembling of those parts which, under use, must maintain their physical integrity. This is merely a special type

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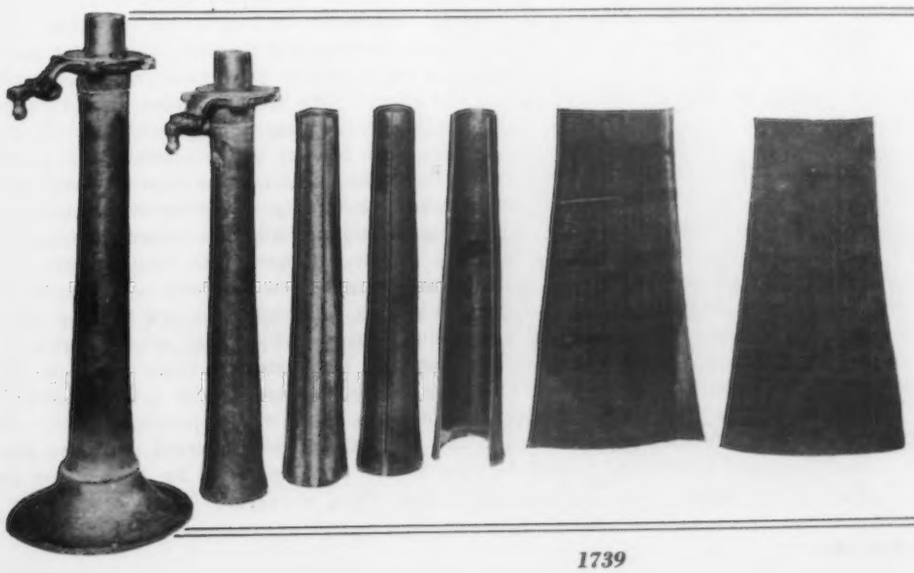

Fig. 1—Various Steps in Manufacture of Two Sheets and One Forging into a Rear Axle Housing

of resistance butt welding, wherein the parts to be welded are gripped in vises or fixtures and complete the secondary coil of an electric transformer. A current of low voltage but high amperage flows across the joint, heating it rapidly to the plastic condition. At this instant, suitably applied pressure forces the two parts together, the burned metal is pushed aside in a fin or flash and a true weld, comparable with that obtained from forge welding, results. The correct welding heat for a flash weld is from 100 to 200 deg. Fahr. less than the melting point of the steel. Under test the fracture occurs not at the weld but somewhere else in the metal of which the part is composed.

Radical changes have been made in many of the Ford welding machines to make the process successful. Speaking generally, the resistance welders take their power from a 440-volt line. A comparatively high secondary voltage is used, the electrodes are unusually husky, the pressure is applied more quickly and many times automatically, there is provision for upsetting sufficient to squeeze out impure or oxidized metal and at the same time prevent further deep-seated oxidation. An upsetting pressure of 5 tons per square inch is used. On many jobs a self-indexing fixture is added. In some machines two welds are made at one time.

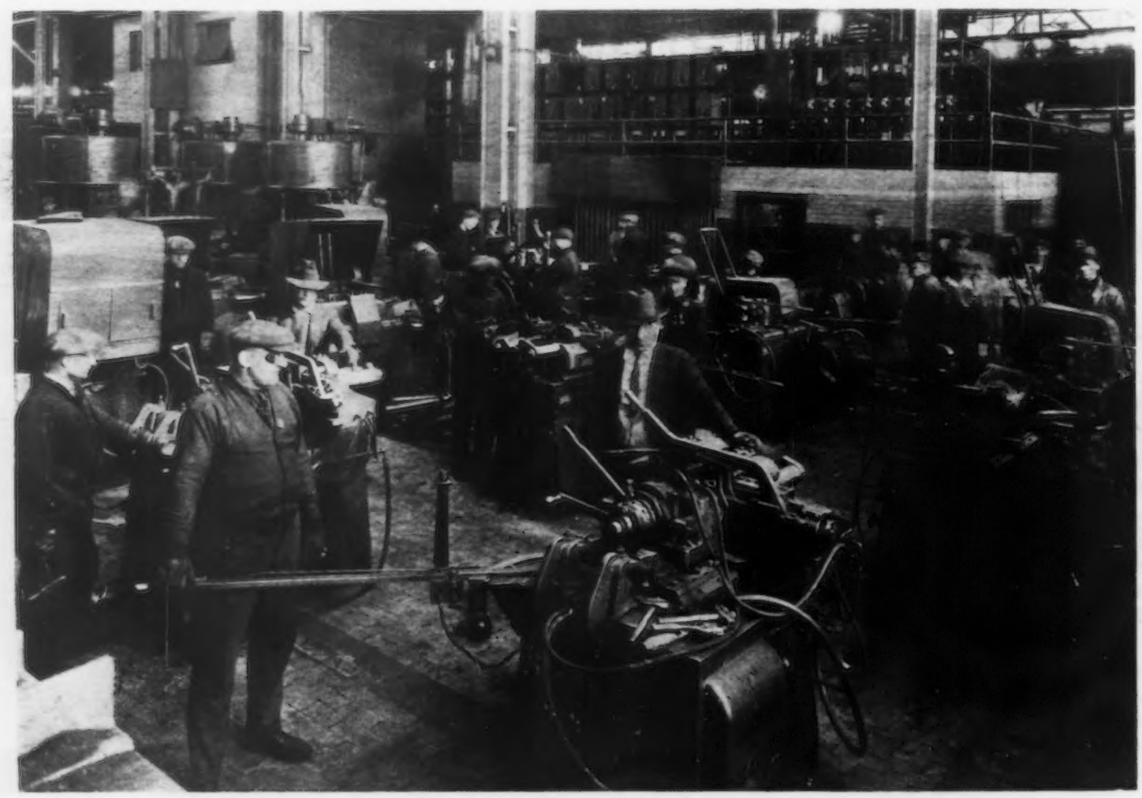

Fig. 2—Battery of Butt Welders for Joining Tapered Tube to Bell Flange and Hub Forging. Note guards attached to machines at rear to protect operators from flying sparks

Welded Rear Axle Is Unique

Perhaps the rear axle housing is one of the most interesting and outstanding jobs assembled by welding. It is made up of three main parts: (a) the bell, a spun forging, (b) a sheet metal tube, rolled and seam welded, and (c) a combination brake and axle support, a welded forging. These three main units are combined so as to make a single piece of metal of varying physical characteristics suited to their needs, but nevertheless one piece. Then two of these axle housings are attached to the differential housing, in itself a welded part consisting of a bent channel and a forging.

Fig. 1 shows the various steps in the manufacture of the axle housing. A piece of sheet is cut the right shape, the edges are curled, then it is bent to a U shape, and next the U is closed into a tube. All these are press operations. Next the longitudinal joint is welded, then the wheel hub is butt-welded to the small end of the tube, and the bell butt-welded to the larger end. The latter two operations are done in a battery of flash welding machines, illustrated in Fig. 2, which utilize the electric resistance principle already described. (The bell end is an interesting piece, being spun from a hot disk of metal in the machine shown in Fig. 3.)

The differential housing bell weighs 9 lb.; the tube weighs 7 lb.; and the wheel hub weighs 4 lb. The finished job, completely welded with flash ground off, weighs 18½ lb.

Differential Housing Also a Fabricated Piece

As stated above, in the car assembly the differential housing is bolted between a right and left hand axle housing. As shown in Fig. 4, this is made of a bent structural shape and a forging. The small channel section is rolled in the Ford 14-in. merchant mill. Fig. 5 shows stock at the left. It passes first through an electrically driven shear and punch (not clearly shown, at the rear center) which blanks to size and pierces two holes in the web. The first die operation (shown at the left in Fig. 5) gives it a wave-like shape; the next machine, with die shown in detail in Fig. 6, curls it into an incomplete circle. Next, the holes previously punched in the web are heated by placing them upon a horizontal pipe and pushing them past a series of burners which heat seven rings at a time. This anneals the metal at those spots so the holes may be flanged inward in the press, shown in the center of Fig. 5, fitted with a punch and die. As shown in the illustration, the completed parts are carried forward to the next operation by hooking on an overhead endless chain conveyor.

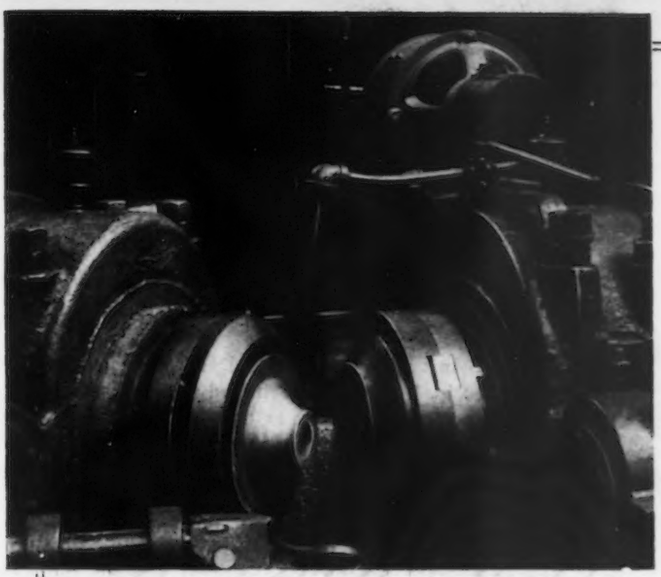

Fig. 3—Hot Spinning Machine for Making Bell End from a Flat Disk (at Left)

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Fig. 4—Bent Channel and Drilled Forging Assembled by Butt Welding into Differential Housing (Below)

Fig. 5—Fabrication of Channel Rings. Flat stock at right, punch and cut off at rear center (not shown), wavy form pressed at left, curled to ring in press at left center, holes in web annealed in group of gas flames in foreground, flanged inward in punch at center, and completed rings transported on overhead conveyor (Above)

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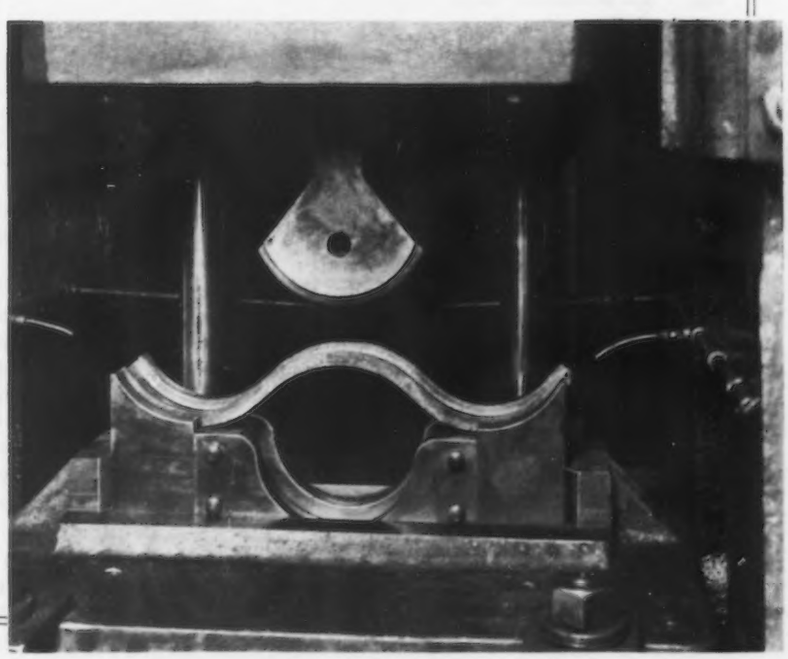
Fig. 6—Press for Curling Channel into Open Ring (at Right)



Differential neck and ring are assembled in a welder (Fig. 7) of Ford design and construction, built in the main tool room at Fordson. The view shows the guard open, ready for loading. The three-quarter circle of channel is placed between the jaws of the welding machine, and the forging is placed above them (just opposite the position of Fig. 4). Turning an air valve clamps the two rigidly in correct position. The door

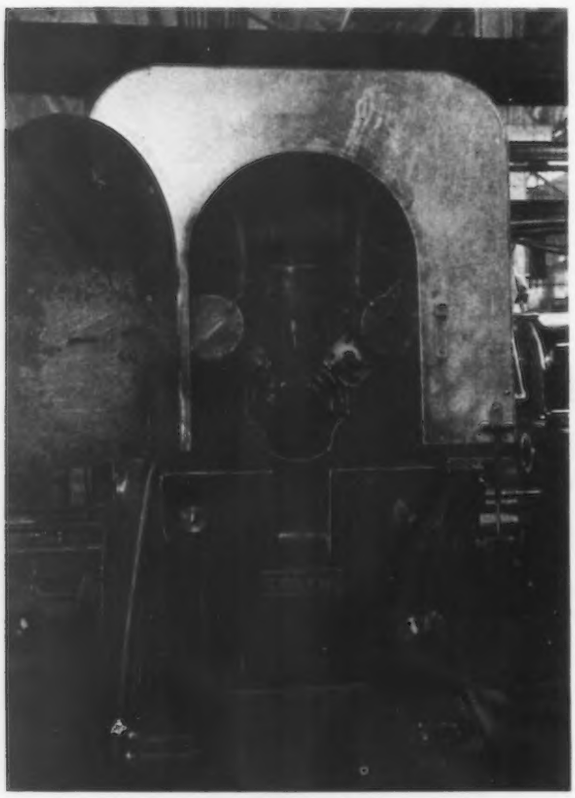


Fig. 7—Clamps on Resistance Welder for Making Two Welds Simultaneously on Differential Housing (above)

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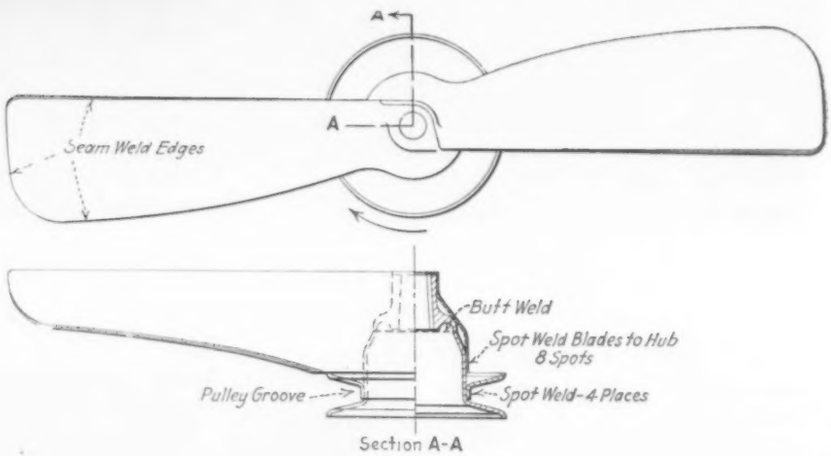
Fig. 8—Assembly Diagram of Fan. One forging and four sheet metal pieces (at Right)



is closed and the handle at the side of the guard thrown down. This closes the transformer circuit; in 5 or 6 sec. the current has brought the pieces to a welding temperature, the machine automatically throws the correct pressure on the top piston, and the upset takes place, forcing out the impure metal and causing the two sections to be joined in the form and manner desired. During the first quarter of the upset the current is cut off. The welding cycle goes automatically to completion, opening the air valve at the end and releasing the clamps. The workman then opens the door, removes the completed part, and reloads the machine.

Improvements in this automatic machine over a former type are:

1. Two men are eliminated—one operator runs the machine.

2. One hundred per cent increase in production—two welds made simultaneously on 50 to 60 pieces per hour.

3. Less floor space occupied per unit—75 per cent of the original machine.

4. Welding more uniform—the human element has been removed from the actual welding cycle.

This housing weighs 8 lb. 12 oz.; the area of weld is 2 1/16 sq. in., which is the largest weld in production on Model A at this time.

Muffler Made by Composite Method

An interesting example of composite construction is found on the muffler. In production the outer shell, made of 0.037-in. sheet, is blanked, formed into a tapered tube 30 in. long with a crimped flat side seam. A baffle plate at mid length is held with three rivets. At the large end a bell, which has meanwhile been formed on a punch press, is flash welded to the outer shell, and a small bell end is made and fixed on the other end in a similar manner. An inner perforated tube, 34½ in. long and 2 in. in diameter, is then inserted in a close sliding fit through the central hole in the small bell, central baffle and large end, and spot welded to the small end of the big bell, the other end of the inner shell being left free to expand as temperature rises with the exhaust gases. This inner tube has two interior baffles, properly placed and held in by crimping the tube and spot welding at four places. The inlet and outlet pipes are then flash welded to the bell ends and the muffler is complete. The total weight is 12 lb. 7 oz., and the entire job is done in a remarkably short time. Incidentally, because the muffler is welded into one piece, there is a complete absence of sympathetic vibration or ringing.

Precision Work on Fan

A fine piece of engineering, welded also, is the fan, designed on the principle of an aeroplane propeller, whose pitch, lead, balance and weight are so accurately figured that a precision job of unusual character for such large production is the result. The run-out allowed is only 0.005 in. The hub flange, the pulley body and the belt groove, as well as the two parts of the fan itself, are assembled by spot or seam welding. The fan blade is made of a double layer of 3⅛-in. cold-rolled strip, 16⅜ in. long and 0.0375 in. thick, with minimum elastic limit of 45,000 lb. per sq. in. Each strip is twisted over at its center; one end is formed with the correct curve for the face of one blade, and the other end into the back of the opposite blade. Two of these, assembled and seam welded along the edges, give blades of aerofoil section, with angles of incidence properly modified as the tip is approached. Assembly is as shown in Fig. 8. Seam welding the ends of the blades was illustrated in THE IRON AGE, April 19, page 1082.

Experience with resistance welding would seem to indicate that many of the old forms of assembly will soon be abandoned, and, instead of building up units and bolting them together, they will be designed for

union by flash welding. Instead of starting with a large block of metal and cutting off the excess, the reverse is likely to occur. Lighter parts will be made possible, yet having greater strength. Of course, there is much room for further progress. Special welders will be constantly undergoing reconstruction as the development work progresses. But, with the coming of self-indexing automatic welders, the production welder takes an important place among the automatic machine tools of the modern factory.

Fatigue Resistance of Rail Steel

Endurance Ranges from 46,000 to 59,000 Lb. per Square Inch—Rail Steel Responds to Understressing and to Overstressing Like Mild Steel

BY JOHN R. FREEMAN, JR.*

ARRANGEMENTS were made in May, 1926, by the Gathmann Engineering Co., Baltimore, for the appointment of a research associate at the United States Bureau of Standards to study the comparative properties of rails made from rising steel in the standard big-end-down ingot molds and rails from fully piping (killed) steel made in the big-end-up sink-head ingot molds. A total of 21 heats made by the Carnegie and Algoma steel companies were studied. They were made to meet the specification requirements of the Baltimore & Ohio Railroad and the Canadian Pacific Railway respectively, which are substantially the same as the 1925 A.R.E.A. specification. Nine of the 21 heats were standard; the other 12 were killed with aluminum and cast in Gathmann molds.

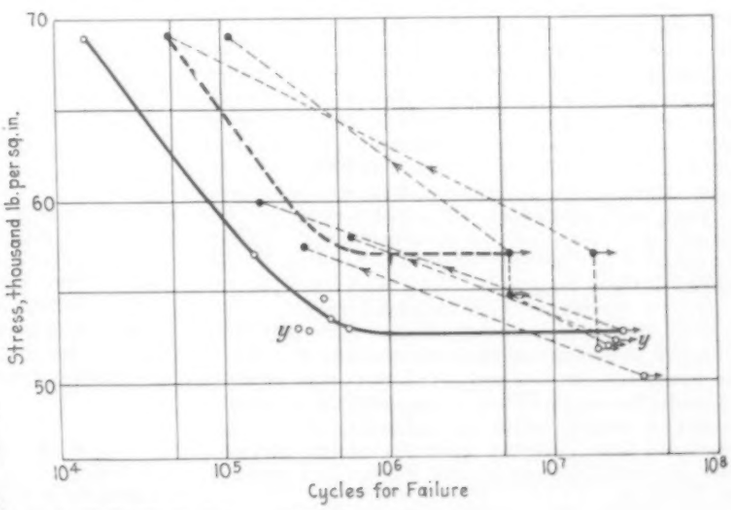
In addition to the usual tests, which included drop tests, nick and break tests, tensile properties, hardness, impact, "M and O" analyses, macro- and microscopic studies, an extensive series of endurance or fatigue tests was made. All test sections were taken at the hot saw.

The comparative test data from the more usual tests confirmed previous investigations, and indicated that rail steel killed with aluminum can be poured free from pipe and excessive segregation in sink-head molds of the Gathmann type and that the distribution of carbon, phosphorus, sulphur and silicon occurs in the same manner in such ingots as in sink-head ingots of other types. The tensile properties of rails rolled from both types of ingots were found to be essentially the same, but were appreciably more uniform in rails rolled from Gathmann ingots, especially in the A rails. Details of these findings are given in Technologic Paper No. 363 of the Bureau of Standards, entitled "Endurance and Other

*Metallurgist Bureau of Standards, Washington. Publication approved by director.

Fig. 1—Location of Tests in Head of Rail. Two contiguous specimens taken at all positions, except y, served to establish fatigue limits

Fig. 2, Below.—Endurance of B Rail from Rising Steel Ingot. Full line for steel in original condition. Dotted line for steel after understressing



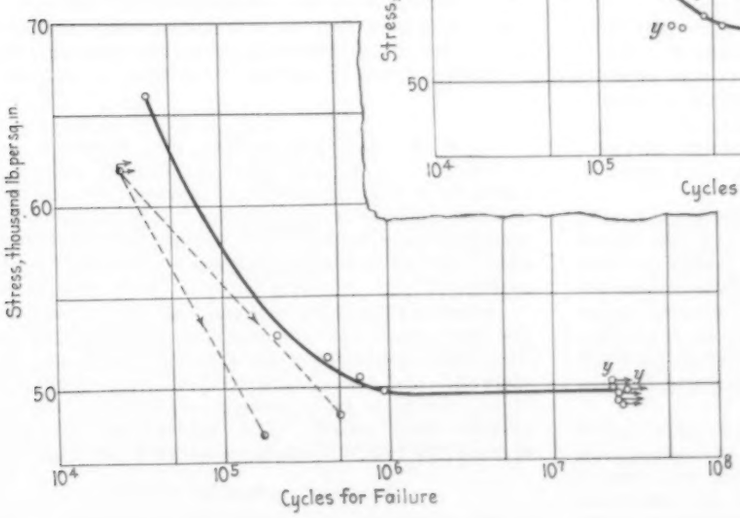


Fig 3, Left.—Endurance of B C Rail from Rejected High-Phosphorous Ingot (Killed Steel). Full line for steel in original condition. Dotted lines for steel after overstressing

Properties of Rail Steel," by R. L. Dowdell, William J. Berry and the present author.

Nature of Transverse Fissures

All students of transverse fissure failure agree that it is a special case of fatigue failure in which the crack starts from a nucleus inside the head of the rail and progresses from the inside to the outside, instead of from the outside to the inside, as is typical of most fatigue failures. Controvery centers about the existence of, nature of, and the causes for the nucleus of the fissure and not about the method of propagation of the failure. It was felt that some light would be thrown on this perplexing problem if the endurance properties of commercial rails were investigated—something which has not yet been done, so far as the writer is aware.

Endurance tests were therefore made on specimens from A and B rails representing 11 of the 21 comparative heats. Four of the 11 heats were poured according to standard practice; the other seven were killed with aluminum and poured in the sink-head molds of the Gathmann type. The rotating beam type of endurance test was used, and all tests were made on a 25,000,000-cycle basis.

Table I—Endurance Limit of Steel from B Rails

Heat No.	Endurance Limit B Rail, Lb. per Sq. In.	Rockwell Hardness B Scale	Tensile Strength Average A and C Rail, Lb. per Sq. In.	Endurance Ratio
8 S (a) ..	52,700	98.3	125,750	0.41
9 S	52,200	98.4	113,550	0.46
10 S	47,800	97.9	125,650	0.38
21 S	53,800	98.7	121,500	0.44
1 G (b) .	50,400	98.5	119,900	0.42
2 G	57,600	99.4	133,200	0.43
3 G	54,200	99.7	131,880	0.41
17 G	49,600	95.5	120,250 (c)	0.40

(a)—S signifies standard ingot.
(b)—G signifies sink-head ingot.
(c)—Test on B rail.

The nature of endurance testing requires several independent specimens to determine the endurance curve. Since there was not sufficient material to take them contiguously along the length of the rail, two contiguous specimens were taken from each position indicated in Fig. 1, giving 12 specimens from each rail.

The specimen marked Y nearly corresponds to the "M" position, where drillings for analysis are taken. It might be expected to contain a greater concentration of inclusions and consequently have inferior fatigue-resistant properties, as it is a well known fact that inclusions may exert a profound influence on the behavior of metals when subjected to reversed cycles of stress. To determine the validity of this hypothesis the endurance curves were determined from the specimens other than the Y specimens. The latter were then run at stresses at or very near the endurance limit. Failure in a relatively low number of cycles indicated a relatively low fatigue resistance. This was more particularly true in specimens from sink-head ingots.

Figs. 2 and 3 are typical results. The maximum fiber stress is plotted as ordinate and the number of cycles for failure as abscissa, the latter to a logarithmetic scale for convenience. The original endurance curve is that designated in the figure by the open circles and full lines. Endurance limits of the rail steel studied, determined from similar curves, are given in Table I and II.

It has been established by many investigators that the endurance limit of steel is more closely correlated with the tensile strength than with any other physical property ordinarily determined. The ratio of the endurance limit to the tensile strength is commonly called the "endurance ratio." These values together with the values for tensile strength and Rockwell-B hardness are also given in Tables I and II for the B and A rails. respectively.

When all tests from both A and B rails rolled from standard ingots are plotted on one sheet, the relatively wide "scatter" of the individual test results indicates an apparently wide variation in endurance properties of rail steels made to meet the same specification requirements. In both standard and Gathmann ingots the minimum endurance values were found in A rails. The minimum value obtained on rails rolled from standard ingots is slightly less than for rails rolled from sink-head ingots. This minimum value of approximately 46,000 lb. per sq. in. represents the endurance limit of steel from 100-lb. section rail rolled from standard ingots. It is the maximum value of repeated stress to which the steel in the head of any A or B rail of the section and composition tested in this investigation may be subjected without danger of failure by fatigue. The maximum value of approximately 53,800 lb. per sq. in. shown by similar rail steel indicates what might be obtained under optimum conditions.

The rail steels tested that were rolled from sink-head ingots could not with safety be subjected to higher repeated stresses in service than the rail steels from standard ingots, because of a low endurance limit shown by one of the rails. It is evident, however, that the maximum value of approximately 59,000 lb. per sq. in. shown by these rail steels is considerably higher than was obtained on the steels from the standard ingot rails. This indicates that under optimum conditions of manufacture killed rail steel cast in sink-head ingots might have higher endurance properties than present-day standard rails made to the same specification requirements.

Effect of "Overstress"

It has been shown by several investigators that if a steel specimen is subjected to a number of reversals of stress *above* its endurance limit, but not sufficient to cause failure, the specimen will then fail in fatigue at a stress considerably below its true endurance limit. The ability of the material to withstand repeated stress has been decreased; its endurance limit has been lowered.

A test was made to determine if this were true for rail steel and the result is given in Fig. 3. Two specimens were first subjected to 25,000 cycles of stress at a stress value of approximately 62,000 lb. per sq. in.—which it was known would eventually cause failure at about 60,000 cycles. The specimens were then subjected to cycles of stress at stresses below the endurance limit, which stress, it was known, would never cause failure were the material in its original condition. But both specimens failed, proving that the repeated overstress had caused incipient damage sufficient to cause a distinct lowering of the fatigue resistance.

Table II—Endurance Limit of Steel from A and AB Rails (a)

Heat No.	Endurance Limit, Lb. per Sq. In.	Rockwell Hardness B Scale	Tensile Strength, Lb. per Sq. In.	Endurance Ratio
8 S (a) ..	(c)	101.4	.....	...
10 S	46,200	98.6	132,400	0.35
1 G (b) ..	47,800	99.2	120,400	0.40
3 G	55,000	101.1	129,750	0.42
18 G	57,400	98.9	.....	...
19 G	59,200	98.4	134,750	0.44
20 G	53,600	100.3	115,750	0.46

(a)—In view of the relatively large crop from sink-head ingots, one of the manufacturers designated the first rail the B rail instead of A rail. These rails have been called AB rails and classed as A rails.
(a)—S signifies heat poured in standard ingots.
(b)—G signifies heat poured in sink-head ingots.
(c)—Less than 50,000 lb. per sq. in. Insufficient material to complete the test.

Effect of Understress

It is also well known that, if a specimen is subjected to a relatively large number of reversals of stress at a value below its endurance limit, the ability of that material to resist fatigue stresses has been increased—its endurance limit is raised. This effect also holds for rail steels, as illustrated by the dotted curve in Fig. 2.

In determining the original endurance limit five of the test specimens did not fail in 25,000,000 cycles. These five specimens were then considered as a "new" material, and the endurance limit was redetermined. It was found to be approximately 4300 lb. per sq. in. greater than before. The "understressing" had increased the fatigue resistance about 8 per cent.

Relation to Service Stresses

These effects of overstressing and understressing may offer a possible method of determining whether

rails in service are being subjected to stresses greater or less than their endurance limit, by determining their endurance limits before and after service. If the endurance limit has decreased, it would indicate that the material has been "overstressed" and, conversely, if it has increased, it would indicate that the material has been "understressed."

There are, of course, certain limitations to this theory, such as the effect of the total number of repetitions of stress in service, the magnitude of the stresses, and their direction, whether in tension or compression.

In cooperation with the Baltimore & Ohio Railroad and the Canadian Pacific Railway endurance tests are now running on specimens from rails that have been in service, made from heats whose edurance properties have been previously determined.

It should be remembered that these endurance limits are based on tests of practically random specimens of steel from certain rails and are not necessarily a representation of the endurance of the rail as a whole. In an endurance specimen of the rotating-beam type, the volume of material that is subjected to the maximum stress is extremely small; in a rail in track, comparatively large. The neutral axis of the test specimen might contain a serious flaw which would not affect the endurance of the small specimen (which fails from stresses at the surface), but, if existing in the rail in track, might seriously reduce its life.

Internal stresses in a rail will affect, also, its endurance properties. When small specimens are cut from a rail and machined, internal stresses present may be relieved or redistributed so that the endurance range of the steel in the specimen may not be the same as it would have been in the rail. Nevertheless, it is reasonable to begin the study of the endurance properties of rails by first determining the endurance properties of the steel in the rails, using the most common type of endurance test so that comparison may be made with available data on other types of steels. It may be desirable eventually to determine the endurance properties of rails, making the tests on the full section of the rail. Before such tests are made, a more complete knowledge should be had of the magnitude and distribution of stresses in rails under all conditions.

Economic Value of Safety Work

How It Pays in Direct Savings and Indirect Advantages—Morale an Important Factor

BY L. H. BURNETT*

TWENTY years ago Judge Gary, chairman of the United States Steel Corporation, called together the casualty managers of the larger subsidiary companies of that organization. These casualty managers were in daily contact with all the loss, suffering and sorrow caused by industrial accidents. They were thoroughly familiar not only with the direct results of industrial accidents but also the indirect results—loss of life and limb, loss of earning power of the bread winner, widows and children left without adequate support. The only thought at that meeting was that too many men were being hurt and killed in industry and that means must be found for preventing, or at least decreasing, the number of accidents.

It was well understood that such a campaign would be costly and expensive. But, whatever the cost, it was determined that such accidents should be prevented in so far as possible. And this has been the spirit of the safety campaign from its inception. It has been firmly based upon the humanitarian motive. There was no thought of economic gain or advantage until long after safety had been sold to thoughtful employers and employees. If our plea for safety had been based upon economic grounds it might have fallen upon deaf ears—it might not have received the hearty support of the press. But, based upon humanitarian and sentimental reasons, it naturally attracted the attention and support of the public.

It is difficult, if not impossible, completely to separate the humanitarian from the economic side of safety work. The two go hand in hand. The underlying motive has been and always will be the humanitarian side. But experience has taught us that many economic advantages inevitably flow from intensive safety work.

Considered solely from an economic standpoint, the advantages of safety work or accident prevention in industry are both direct and indirect. The direct advantages are obvious and the savings can be measured in dollars and cents.

Every accident prevented means a saving of just so much in compensation and necessary medical care and attention. Whether an employer carries compensation insurance, State insurance, or assumes his own risk, the benefits derived from prevention of accidents are substantial and immediate. The experience of a large foundry company with an average working force of 500 men affords an excellent example of money savings due entirely to intensive safety work.

Time lost due to accidents in 1925 was 62½ days for each 100 tons of castings shipped. The cost of accidents was 66c. out of every $100 of payroll. In 1926 the lost time was 30 days per 100 tons of castings shipped; the accident cost being 19c. per $100 of payroll.

In 1927 an intensive safety campaign was conducted. As a result the time lost was ½ day per 100 tons of castings shipped; costing 1c. per $100 of payroll. Actual reduction in total costs, due to accident prevention, is indicated by the following figures:

1925—cost of accidents was	$7,033.03
1926—cost of accidents was	3,132.88
1927—cost of accidents was	121.50

A public utility employing an average force of 1500 men, by reducing accidents, cut its compensation costs from 30c. per $100 of payroll in 1926 to 6½c. in 1927. A large steel works employing 5000 men cut compensation costs from $24,378.89 in 1926 to $10,407.45 in 1927, showing a saving of $13,971.44. These figures do not include savings due to decrease of medical and hospital service.

One of our largest car and foundry companies spent $1,000,000 for accident prevention in 14 years and saved $2,700,000 in losses and other costs. It is said that the United States Steel Corporation spent $9,763,063 in safety work in 10 years and showed an actual saving of $14,609,920.

In view of these records there can be no doubt that accident prevention work does pay from a purely economic standpoint. And let us not forget that these figures show only the direct savings in compensation. They do not reflect the many indirect benefits, not only to the employees but to the public at large.

Safety Work an Aid to Production

When intensive safety work was first begun there was a general feeling among industrial leaders that it would seriously interfere with and hamper production. Only after many years were safety engineers able to

*Vice-President, Carnegie Steel Co., Pittsburgh. This is abstract of an address before the Pennsylvania Safety Congress, at Philadelphia, on March 21.

demonstrate that accident prevention work, far from being a hindrance to full production, was and is an aid. For the safety campaign has long since graduated from mere safeguarding of dangerous machinery to the position of an ever increasing and active educational force in industry. It demands the thought and attention of every man in the organization.

A safe plant must be a clean and orderly plant, and cleanliness and orderliness have been found necessary for good production. A safe plant must be well lighted and have dark and dangerous places eliminated. It has been demonstrated time after time that good lighting is an actual aid—in fact, absolutely essential—to good production.

Absence of workers due to injuries causes changes in personnel requiring the hiring and training of new men. The bare cost of hiring a new man will run from $30 to $80. Such accidents disrupt the morale of an organization. Accident prevention conserves the time, energy and physical fitness of employees. It produces a more stable and contented working force, and "a stable, contented and highly efficient working force is the fondest dream of every manager, every department head and every foreman."

A recent survey of 14,000 industries employing 2,500,000 workers, comparing results of 1922 with 1925, shows 12 per cent increase in production and 18 per cent decrease in accidents. Blast furnaces show an increase in production of 60 per cent in the last 10 years and a 50 per cent decrease in accidents.

Today accident prevention is just as much a business proposition as production. No plant can truthfully be said to be on a sound business basis until safety is as much a matter of daily consideration and practice as quantity and quality of production. And the average mill worker today can buy life insurance at the same rate of premium as the office worker or other preferred risk. Before we had accident prevention, he was compelled to pay a much higher rate.

In fact, it is undoubtedly true today that, whether we look at accident prevention from the humanitarian standpoint or from the economic side, we can safely say that it pays; that it is worth while, and that it is worth much more than the effort and energy expended or the dollars and cents invested.

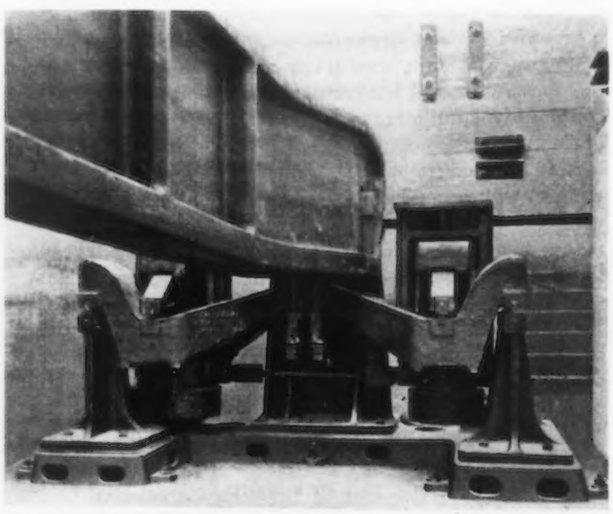
WEIGHING MOLTEN IRON

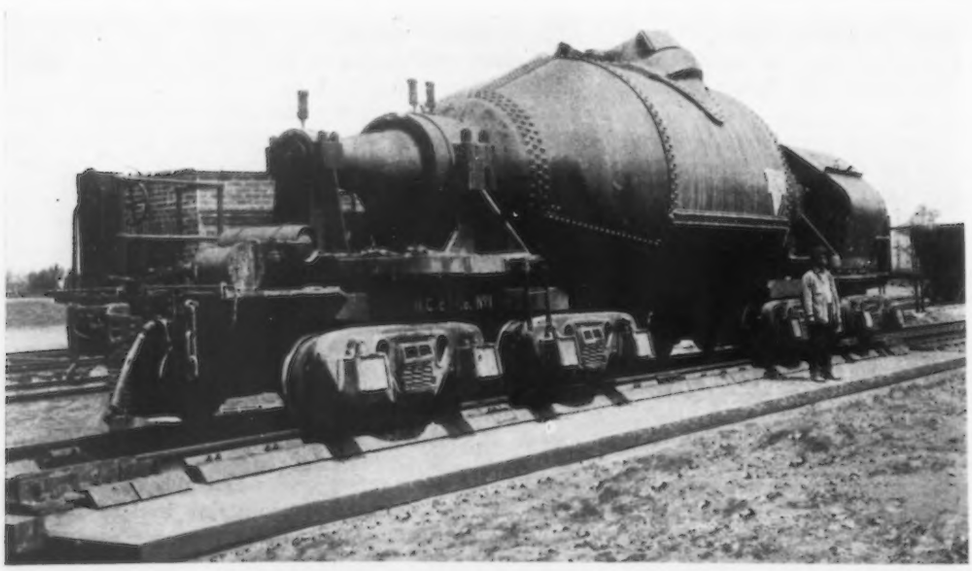
Heavy Track Scale for Hot-Metal Cars of Large Size

INSTALLATION of an 800,000-lb. beam capacity, two-section, knife-edge scale for weighing molten-iron cars has recently been completed at the plant of the Hamilton Coke & Iron Co., Hamilton, Ohio. Standard-gage track is used and the scale, which has a weigh rail 56 ft. long, is built in two sections. The rail stands are supported by steel cross ties. The deck of ⅜-in. steel plate is covered with firebrick and a special type of storm guard protects the openings made by the rail stand housings.

Four primary or main levers transmit the load to a transverse extension lever, which is connected to the weigh beam. The beam is type registering and double slides have been provided by the builder, Fairbanks, Morse & Co., St. Johnsbury, Vt., so that weights can be taken to an accuracy of 20 lb., if required.

Although this scale was built primarily to weigh molten iron, it will be used also for general service on inbound and outbound freight. Pugh-type hot-metal cars are used to transport molten iron a distance of 12 miles to open-hearth furnaces at Middletown, Ohio. Each car has a capacity of 150 tons and the weight of a car and its full load is 343 tons. This load is carried on a wheelbase of 45 ft. 6 in., with a maximum axle load of 85,600 lb. Each car is built with two eight-wheel trucks. In addition to providing transportation for hot metal, these cars also furnish hot-metal storage capacity.





Lever Construction (Above) Is Unusually Heavy. This scale is of the two-section, suspension bearing, knife-edge type

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The Deck of This Scale (Left) Is Overlaid with Firebrick. The molten-metal car with full load weighs 343 tons

Ways to Improve Gray Iron Castings

High Strength of Super-Heat or "High-Test" Irons Points to Recapture of Lost Markets--High Malleability Attainable Also

BY DR. RICHARD MOLDENKE*

RECENT achievements in the improvement of cast iron, brought out more particularly by German metallurgists, at least partially explain why marked increases in strength are obtained without serious reductions in the carbon content of cast irons. The explanation is based upon the influence of temperature on the physical condition of the graphite precipitated during the change in the iron from the molten to the solid phase. It must be patent that the slower the cooling—or the interval of time between the liquid and the solid state—the larger the crystals formed in a solution of a given material sufficiently concentrated to contain nuclei of that material as starting points of such crystals. And, per contra, the faster the cooling rate, or the shorter the interval of time in setting, the smaller the crystals of the resulting solidified mass. Graphite forms no exception to the rule, for, under ordinary conditions of melting, with slow cooling of the molten carbon-iron solution when poured into dried or even heated molds of a low heat-conducting power —such as of sand—the crystals formed will be very coarse; whereas, the same iron poured into molds of high heat-conducting power—such as metal—will not contain any precipitated graphite as fine crystals.

Superheating Destroys Graphite Nuclei

Naturally, to obtain any graphite crystals at all, there must be present, or formed, graphite nuclei or starting points for crystals in the liquid metal either before or during the period of setting. The size of the crystals will depend upon how much time elapses between the commencement of crystal growth, out of the nuclei of graphite, and solidification. The importance of the recent research developments lies in there having been located in gray cast iron, melted under ordinary conditions of melting and superheating, an abundance of microscopically small graphite nuclei—nuclei which serve as the starting points of coarse crystal growth when the metal freezes and give a weak cast iron. Further, by superheating the molten metal to extremely high temperatures the graphite nuclei disappear completely by solution in the iron, and in the subsequent cooling the growth of large graphite crystals cannot take place with no nuclei present.

Only when considerably cooled—in fact, actually supercooled below normal freezing ranges—will graphite nuclei form again that could serve for the growth of large crystals, were there time to allow this before the metal is solid. As a matter of fact, when the graphite nuclei do form in such a super-cooled molten iron, the temperature will have dropped so close to the freezing point that there is time only for the formation of very fine crystals, and a strong metal results. Hence an iron melted under conditions of superheat, far beyond the ranges of ordinary practice, may give castings perhaps twice as strong as the same iron melted with the ordinary degree of superheat.

The above statement may be proved by melting a charge of gray cast iron in a crucible or in a resistance electric furnace. When just liquid, a test piece is poured with one end against a chill. Photomicrographs made of the hard and the soft ends of the casting will show the graphite nuclei in the white portion of the metal, and the large graphite crystals in the gray. If, now, the remainder of the charge is successively heated up a hundred or more degrees Fahrenheit, cooled down to the first pouring temperature, and corresponding test pieces and photomicrographs are made, the graphite nuclei in the chilled portions will be found gradually to disappear as the high temperature ranges are reached, whereas in the soft portions, similarly, the crystals of graphite will have become smaller and smaller. If enough metal is used to permit the making of tensile test specimens in sand molds in each case, the strengths will be found to go up as the degree of superheat rises.

There is doubtless an additional explanation for the strength increase incident to melting under conditions which give high superheat. At temperatures equal to those of molten steel, an iron containing over 2.50 per cent total carbon and possibly as much silicon, with manganese up to 1 per cent, can hardly tolerate the presence of dissolved iron oxide. This will certainly be reduced, just as when adding ferromanganese to a "blow" of Bessemer steel to deoxidize it; and a thoroughly deoxidized cast iron will gain correspondingly in quality. Even in ordinary foundry practice, it is known that melting very hot means less sulphur picked up from fuel, less chances for blow-holes and generally better castings. In fact, the rule is to pour as hot as the sand will stand it. Again, foundrymen know that the hotter the metal, the deeper the chill—especially when running low-silicon irons. Doubtless the disappearance of the graphite nuclei under conditions of extremely hot melting helps to retard the formation of large graphite crystals, and therefore the metal can chill deeper. It is gratifying to have at last an explanation of the phenomenon of higher combined carbon results from hotter iron, not only in the case of chilling irons, but in general foundry practice.

Hold Superheated Metal Before Pouring

It does not follow, however, that in cupola melting, when operating under low degrees of superheat, soft iron will result because of the ready growth of large crystals of graphite from the nuclei present in the molten metal. Melting cold may result from an unduly low fuel bed, and this causes an oxidation of the iron. This, in turn, results in a higher freezing point, reducing the normal interval of time for crystalline graphite growth before the metal solidifies. Hence hard iron. In the case of furnace melting, however, cold molten iron does mean softer metal, for in malleable castings practice, with air furnace melting, an iron with about 0.75 per cent silicon can give white cast iron when dipped from the hot surface of the bath, and gray iron when tapped out from the colder bottom. This occurs if the samples are taken just before the entire bath is hot enough for tapping out, and if the test pieces are of large enough cross-section.

A further point of practical importance is learned

*Watchung, N. J. Abstract of a paper presented at the European Foundrymen's Congress, Barcelona, Spain, in April.

from the researches under consideration. Melting under conditions of extreme superheat on the part of the metal produced necessitates that it be held, before pouring into the molds, until it can cool to the desired pouring temperature. If the metal were poured into the molds at once, allowing the sand body to absorb and dissipate the surplus heat, not only would the sand surfaces suffer, but the added heat to be cared for by the sand would so retard the freezing of the iron that large crystals could grow from the nuclei finally formed during the cooling, even if the entire graphite of the mixture—that is, including the residual graphite nuclei—had been dissolved in the high-temperature melting. Hence this intensely superheated molten iron should be allowed to dissipate into the air all heat above regular pouring temperatures before being poured off into molds.

In ordinary foundry practice, the molder, when he receives molten iron and he thinks it too hot to use, instead of holding it to cool, often adds a piece of scrap or some of the gates or sprues. This saves him time. Be it noted, however, that if the theory of crystal growth from graphite nuclei is correct, the molder, besides cooling his metal, will have a goodly quantity of graphite nuclei from the cold gray iron scrap added, which his now colder iron is not able to dissolve. The result will be that he has reduced the quality of his dearly won extremely superheated iron to that of an ordinary melt.

Composition of High-Test Irons

The foundryman, hearing of the wonderful strengths and other qualities in cast iron obtained as the result of the recent researches, naturally wishes to approach, if not actually duplicate, them in his own establishment. He first looks up the compositions of these high-test cast irons and finds them high in silicon, at the upper ordinary manganese limit, low in sulphur and phosphorus but with the total carbon quite low so far as ordinary means of obtaining this is concerned, 2.80 per cent total carbon for cast iron not being easily obtained from the cupola. It can just be done in the air furnace, using the maximum percentage of soft steel scrap—about 35 per cent. The open-hearth and the electric furnace can handle the situation readily.

Most foundrymen, however, have only the cupola to melt with, and when it is recalled that steel melted in the cupola absorbs about 2.75 per cent carbon from the fuel, to get the desired 2.80 per cent total carbon in the castings would mean a practically 100 per cent steel mixture. Since, however, with the aid of ferroalloys, particularly in the cement briquetted form—there are also other ways to protect the descending ferroalloys, such as mixing with clay and vitrifying, or mixing with cast borings and inclosing in steel containers—there is no reason why every foundryman should not at least improve his work by using high steel scrap mixtures, or by using steel altogether for his very special castings. With high steel percentages, it is necessary to have enough silicon and manganese available while melting, as, under the very high temperatures involved, there is a chance of oxidation from the carbon dioxide of the cupola gases and, without the deoxidizing action of the two elements in question, a sorry metal would come out over the spout.

To get somewhat closer to the melting details, the first question to consider is how to obtain from the cupola the very high temperatures desired for the molten metal. This involves a sacrifice in fuel, and perhaps the best example of actual operation is to be found in making large radiators, for which the molten iron required must be snow-white, to avoid heavy losses through "cold-shuts" in so thin a class of pressure castings. Here, melting has to be done with a moderate blast volume—say that giving about three-quarters of the normal hourly tonnage capacity. The fuel bed must be high enough to allow a time interval of 10 to 12 min. between putting on the blast and observing the molten metal running from the open tap-hole over the spout and into the receiving ladle or forehearth. Furthermore, even with the best of coke, the ratio of metal to fuel between charges should not be more than 8 to 1 and, with high ash cokes which are rather friable, this may have to drop to 6 to 1. The metal charges must be small enough to hold the intermediate coke charges down to a layer about 4 in. thick, and charging must be done carefully to get level layers. If, after the cupola has been fully filled, this can be let stand for an hour or more, to warm up well, the first iron will be hot enough to use, and, very shortly after starting, the molten metal will come out extremely hot.

Results of Alloy Additions

Until the recent developments in "high-test" cast iron, the only apparent avenue of betterment of gray iron castings seemed to lie in the addition of such metals as nickel, chromium, vanadium, etc., or the production of alloy cast irons. These could be produced either by direct addition to the ladle or cupola, or preferably as component elements of the pig irons charged. The quality of the castings was thus unquestionably improved either for strength or wearing qualities. However, the amount and condition of the graphite in cast iron will always have the most powerful effect upon its physical qualities, and giving this more weight when judging erratic alloy, addition results will explain them more satisfactorily.

Some of the actual figures involved will be of interest. For very "high-test" cast iron, tensile strengths hovering around 60,000 lb. per sq. in. have been regularly attained. Transverse strengths almost double the normal, with more than double the deflection, are common. The addition of nickel, chromium, etc., has added another notch to these values, 65,000 lb. and even more being reputably reported. It would appear, then, that, with our present knowledge, cast iron can be made strong enough to recapture much of the market lost to the steel and the malleable casting, and the producer of iron castings should lose no time in doing so.

A Development Which Has Promise

But there is still another development in cast iron which should prove valuable to the foundryman. A considerable reduction in the silicon and manganese content of cast irons, leaving the total carbon, sulphur and phosphorus as given in the previous typical iron, together with the extremely high degrees of superheat given in melting, when poured into castings, gives a class of cast iron not quite so strong as those previously mentioned, but peculiarly amenable to an annealing process which converts the comparatively higher combined carbon contained to the temper-carbon variety without special interference by the finely crystalline graphite present. Thus, a fine-grained gray cast iron can be sent partly on the way of the malleable casting, and light castings with around 1.50 per cent silicon, over half their carbon as fine graphite and with low manganese can be readily twisted. In other words, the material has malleability and can be elongated. Large and heavy castings practically anneal themselves, since only a few hours at 1550 deg. Fahr. are required to accomplish the combined carbon conversion. Thus is another avenue opened to the gray iron founder to retrieve his losses.

Advances Summarized

Reviewing the achievements in the scientific control of cast iron for the last three decades, for they fall within practically that period, it would almost seem that the most important advances have been made only recently, and by scientists rather than men in active operation of foundries. The search for a cast iron which will not "grow" under alternating heat applications, and other problems of a similar nature, gave the

necessary impetus which brought the highly important developments. This is an argument for more extended and, at the same time, cooperative research on cast iron in its various branches, and the several movements going on at the present time in a number of highly industrial countries should be encouraged and financed. At the same time, some method of information exchange should be arranged for which would limit duplication of effort and extend the usefulness of the discoveries that are certain to be made.

Safe Loads for Steels Working at High Temperatures

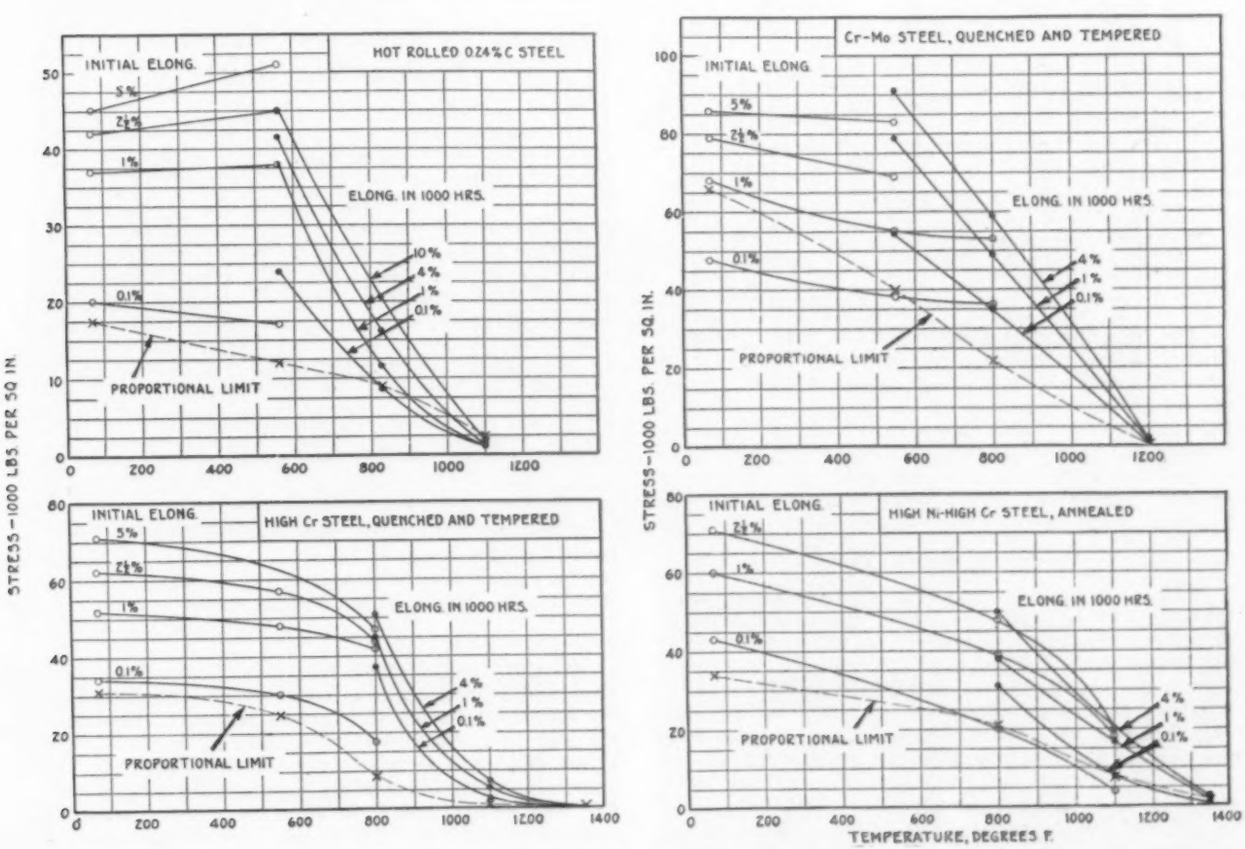
Bureau of Standards Publication Gives Data Whereby Superheated Steam or Chemical Equipment May Be Designed

IT is generally understood that the tensile strength of steels as determined in the ordinary way at room temperature gives little information as to the ability of the metal to withstand stress at elevated temperatures. There has consequently been much study given to the tensile properties from 600 to 1400 deg. Fahr., in view of the decided trend in the power and chemical industries toward higher working pressures and temperatures. Two general types of tests have been performed. In one, the load is applied step by step as rapidly as the corresponding extension can be measured on the hot specimen; in the other, a quiescent load is left indefinitely, and observations are made at daily intervals to see whether gradual extension or "creep" is occurring.

Much work, done principally on the former plan, is reported by H. J. French, H. C. Cross and A. A. Peterson of the United States Bureau of Standards in Technologic Paper No. 362. Their equipment (described in Technologic Paper No. 296) was capable of maintaining the tension specimen at a uniform and stationary temperature to within plus or minus 5 deg. Fahr., and extensions were read to four millionths of an inch. Extreme accuracy is necessary for this work, because a variation of ½ deg. Fahr. will cause measureable changes over a 1-in. gage length. Furthermore, since the elastic limit is low at high temperatures (on the order of 1000 lb. per square inch), the total deformation over a 2-in. gage length is only 0.00002 in. The limit of proportionality between the observed stress at such a low strain can be determined only when the limit of error in each determination is very small.

Five steels were studied: a 0.24 per cent carbon boiler plate, a quenched and tempered chromium-molybdenum steel, an annealed low-tungsten high-speed steel, a quenched and tempered 20 per cent chromium steel and an annealed austenitic nickel-chromium steel. Results for four of these are shown in the diagrams.

It will be observed that each diagram has curves of two different families, one showing performance at relatively low temperatures (where the cold work done on the bar by stretching it past the elastic limit strain-hardens the steel and automatically raises its strength sufficiently to carry the imposed load indefinitely) and the other indicating the relationship between time and the loads which cause continuing creep. For instance, the proportional limit of boiler plate is about 12,500 lb. per square inch at 500 deg. Fahr. Any load below that will be carried indefinitely at that temperature and will not cause permanent set. If a boiler steel under a heat of 500 deg. is stressed at 17,500 lb. per sq. in., the curves show it will acquire a permanent set of 0.1 per cent, but it is still a stable structure. At 800 deg. Fahr., however, this steel must be stressed considerably below 10,000 lb. per square inch if it is to remain in service indefinitely; if it carries a load of 22,500 lb. per


HOT ROLLED 0.24% C STEEL
Cr-Mo STEEL, QUENCHED AND TEMPERED
HIGH Cr STEEL, QUENCHED AND TEMPERED
HIGH Ni-HIGH Cr STEEL, ANNEALED
INITIAL ELONG.
ELONG. IN 1000 HRS.
PROPORTIONAL LIMIT
STRESS—1000 LBS. PER SQ. IN.
TEMPERATURE, DEGREES F.

Loads Required to Cause Either Permanent Sets or Continuing Creep in Steels at Elevated Temperature

square inch at that temperature, it will stretch 10 per cent in 1000 hr.

The authors recommend that ample margins of safety be used for figures taken from these curves because the experimental work underlying them is none too extensive, and the high-temperature portions are based on the unproved assumption that creep as determined at relatively short time intervals continues indefinitely at the same rate. But the values are conservative when compared with results of other investigators. J. L. Cox, of the Midvale Steel Co., has recommended that 80 per cent of these figures be used for design values to allow for unavoidable variations in quality of metal and accuracy of machine work. He also thinks that a container which exhibits creep should be replaced when it acquires a permanent extension of 8 per cent. (See THE IRON AGE, Dec. 15, 1927, page 1662.)

Railroads Spent $432,604,000 for Iron and Steel

Nearly One-Fourth of It Went for Rails in 1927—Locomotives and Cars Cost $30,000,000 in First Quarter

WASHINGTON, June 16.—Class I railroads of the United States in 1927 directly expended $432,604,000 for iron and steel products, according to an annual statement issued by the Bureau of Railway Economics. This outlay was 31 per cent of total expenditures of these railroads last year for materials and supplies of all kinds. Only in the case of fuel were expenditures for iron and steel exceeded, the total for coal and fuel oil being $438,821,000, or 31.4 per cent of the total outlay of $1,395,928,000. The fuel purchased consisted of 130,190,000 net tons of bituminous coal, 3,199,000 net tons of anthracite and 2,765,259,000 gal. of fuel oil.

Expenditures for iron and steel last year, however, as in the case of other lines, were not so great as they were in 1926, when, out of a total of $1,559,032,000, purchases of iron and steel amounted to $507,302,000. In 1925, iron and steel purchases aggregated $419,255,000; in 1924, they were $365,610,000; in 1923, they amounted to $464,955,000. Detailed railroad expenditures for iron and steel in 1927 were as follows:

		Per Cent of all purchases
Steel rails (new and second-hand, except scrap)	$101,567,000	7.28
Wheels, axles and tires	47,435,000	3.40
Frogs, switches, crossings, track fastenings and bolts, spikes, tie plates, rail anchors, etc.	72,032,000	5.16
Iron bridges, turntables, structural steel, bar iron and steel, forgings, fabricated and unfabricated shapes and pressed steel parts	51,267,000	3.67
Flues and tubes for locomotives and stationary boilers	8,191,000	0.59
Telegraph and telephone, interlocking and signal material	25,300,000	1.81
Bolts, nuts, washers, rivets, springs, etc.	19,064,000	1.37
Locomotive and car castings, beams, couplers, frames and car roofs	62,294,000	4.46
Machinery, boilers, repair parts and all other iron and steel products	45,454,000	3.25
Total iron and steel products	$432,604,000	30.99

The bureau quoted the estimate of THE IRON AGE (Jan. 5 issue) that the railroads in 1927 absorbed 6,125,000 tons of steel, amounting to 19 per cent of the total. Rail purchases by the carriers in 1927, the Bureau statement said, amounted to 2,278 000 gross tons, or 86.7 per cent of this class of distribution. With the exception of 1926, the 1927 rail purchases were greater than in any recent year, and were nearly 41 per cent of the steel tonnage bought by the railroads.

Growth in Heavier Rails

After quoting THE IRON AGE, showing percentages taken by the railroads in 1927 of each form of steel distributed, the bureau statement pointed out that during recent years heavier steel rails have been coming more and more into use to meet conditions improved by heavier and denser traffic. Rails of 100-lb. section and over rolled in 1927, the statement explained, were 68.8 per cent of the year's production. In 1926 the corresponding proportion was 61.12 per cent; in 1925, 58.76 per cent; in 1923, 50.47 per cent.

Recognizing the growing importance of extra heavy rail sections, it was pointed out, the American Iron and Steel Institute has made a separate grouping of rails weighing 120 lb. or over. The total for 1927 is given as 617,524 tons, or 22.01 per cent of all rails produced last year. This action, it is added, "recalls that of 13 years ago, when for the first time the 100-lb. rail was segregated from the 85-lb. and over classification, previously the heaviest reported."

Gross capital expenditure by the railroads during the first quarter of 1928, for new equipment and for additions and improvements to property, amounted to $128,428,000, a decrease of $26,594,000 from the corresponding quarter of 1927, and $37,327,000 less than that for the corresponding period of 1926. Of the capital expenditure during the first quarter of this year equipment made up $33,016,000, divided as follows: Locomotives, $10,493,000; freight train cars, $13,601,000; passenger train cars, $5,785,000; other equipment, $3,137,000. Expenditures for roadway and structures totaled $95,412,000, divided as follows: Additional track, $24,744,000; heavier rail, $9,621,000; additional ballast, $1,922,000; shops and engine houses, $7,964,000; all other improvements, $51,161,000.

For the various non-ferrous metal products needed in railroad operation, such as brass, copper, zinc, lead, etc., the railroads spent $55,668,000 in 1927, or 8.8 per cent less than in 1926.

Laboratory Tests of Railroad Bearing Bronzes Inadequate

No one of the selected laboratory tests, consisting of wear, tension, impact and pounding, can by itself be expected to yield information which is adequate for general comparisons of the various railroad bearing bronzes now in use. This is revealed by a study made by the Bureau of Standards, Department of Commerce. According to H. J. French, who was in charge of the work, the bronzes fall into certain general classes, as regards their wearing and mechanical properties, and each group shows superiority for certain types of service.

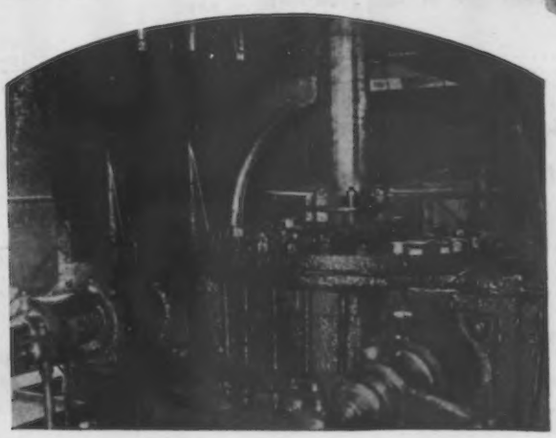
This work was undertaken by the bureau in an effort to secure data which would be necessary if any attempt were made to simplify these specifications, and also because it appeared highly desirable to study the properties of the various railroad bearing bronzes now in use. The study covered wear and mechanical properties at various temperatures.

There are almost as many specifications for railroad bearing bronzes as there are railroads. So far as can be judged from laboratory tests, existing specifications can be simplified, Mr. French states.

Standard specifications for lap-welded and seamless steel and lap-welded iron boiler tubes, as adopted by the American Society for Testing Materials, have been put out in a Spanish-English edition by the United States Bureau of Foreign and Domestic Commerce. The pamphlet, under the heading "Industrial Standards No. 63," may be obtained at 5c. from the superintendent of documents, Government Printing Office, Washington. It contains 18 pages, with the English text on left-hand pages and Spanish on right-hand.

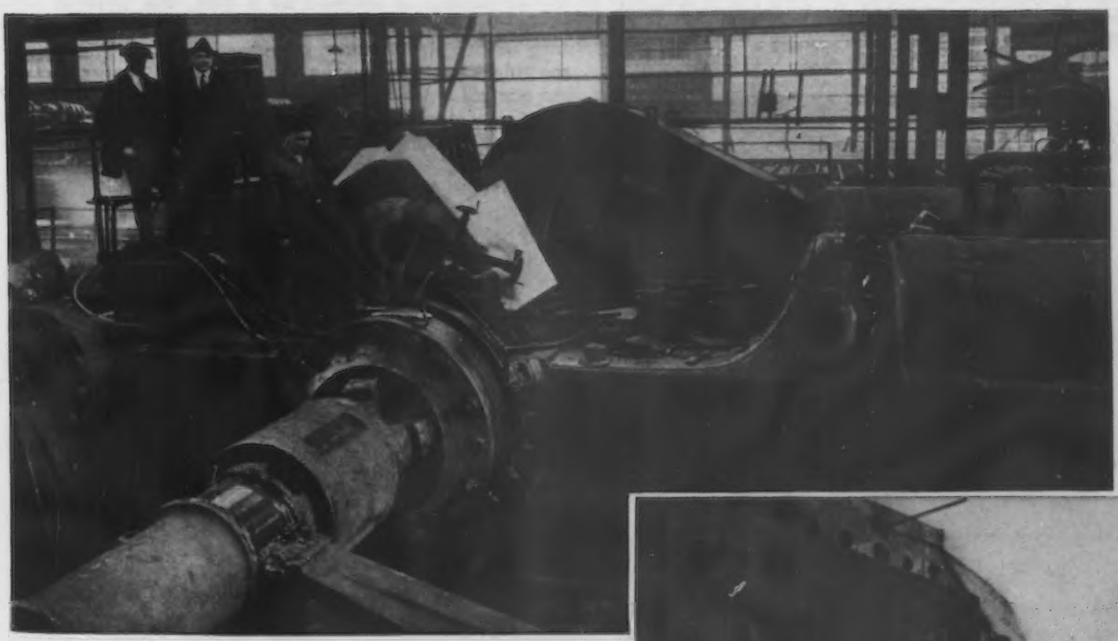
Oxwelding Heavy Mill Engines

CONTINUOUS operation is the goal of steel mill operators; to reach it they install the most rugged equipment. But even this wears and breaks. Accidents which mean serious shutdowns become minor delays in those plants where first-aid from oxy-acetylene welding and cutting equipment is completely utilized.



Water Is Also Necessary to a Steel Plant. At left is a centrifugal pump casing, so badly scoured as to be worthless, but easily renewed with bronze welding rod

TWO Ways of Making Major Repairs by Oxy-Acetylene Welding: Above, a cylinder head so badly shattered that 600 lb. of cast iron welding rod was used in the cracks. At center is a scoured blowing engine cylinder rebuilt with bronze welding rod. Either type of weld is readily machined



A Cutting Blowpipe Finds No Difficulty in Biting a Piece Out of an 18-in. Steel Counterweight to Improve the Balance of This Blooming Mill Engine

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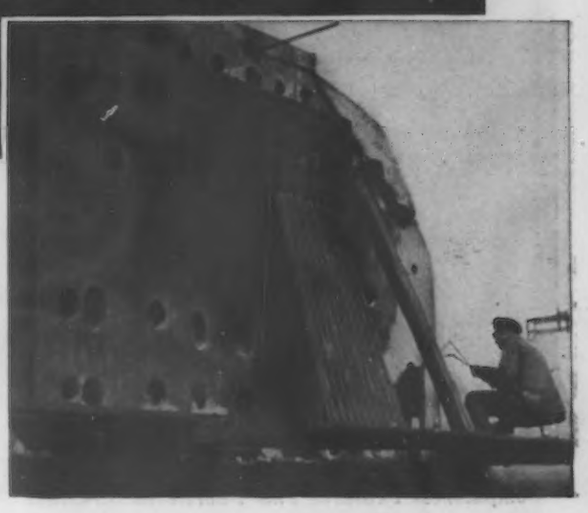
A Break in a 48-Ton Bed Plate Was Bronze-Welded Without Preheating During Removal of Rolling Mill Engine to New Site



EARLY-STRENGTH CEMENT

Made from Slag from Experimental Blast Furnace at Minneapolis

A THREE-WEEKS' campaign was recently run on the 6-ton blast furnace at the Minneapolis station of the Bureau of Mines, using a burden consisting of scrap iron, iron ore, iron-bearing bauxite, limestone and coke. About 70 tons of aluminous slag was obtained, suitable for grinding into "high early-strength" cement, and a somewhat smaller quantity of low-sulphur, low-silicon pig iron.

It is well known that normal blast furnace slag is used as a raw material for the production of standard Portland cement. The high early-strength cements which are attracting so much interest now (and which in France are made in amount equal to one-eighth of the Portland cement produced) are of the following composition:

SiO_2	9 to 12 per cent
Al_2O_3	40 to 48 per cent
CaO	35 to 40 per cent
S	less than 1 per cent

Such a material has a low fusion temperature, approximately 1350 deg. C. When smelting the above-mentioned burden a slag of the following composition was made:

SiO_2	8.5 per cent
Al_2O_3	47.2 per cent
FeO	1.4 per cent
CaO	39.6 per cent
TiO_2	2.1 per cent
S	0.7 per cent

According to a report by T. L. Joseph, supervising engineer for the Bureau of Mines, blast pressure was uniformly low, and an average blast temperature of 885 deg. Fahr. was carried. In his opinion it will be entirely feasible to smelt a bauxite charge in a large blast furnace, and produce a slag which needs only fine grinding to be marketed as a cement, and a pig iron suitable for open-hearth steel making. E. C. Eckel has obtained three patents on a process of making iron and cement in the blast furnace, and the Minneapolis experiment definitely proves that iron oxide in the charge can be reduced to metal. For this reason, a much less pure bauxite can be used than when making high early-strength cement in the rotary kiln or electric furnace, where a mixture of suitable raw materials is merely clinkered or melted.

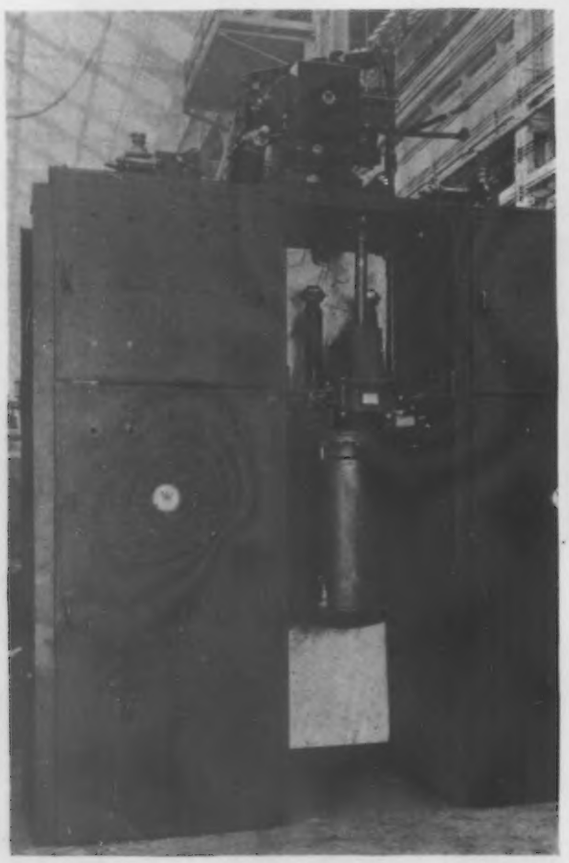
In view of the small amount of silica entering the furnace and the low formation temperature of the slag, little silicon is reduced in the shaft. In order to make pig iron with 0.8 to 1.0 per cent silicon it would be necessary to charge a certain amount of gray cast iron borings or scrap into the furnace. Mr. Joseph's calculations of the economics of such an ore-scrap burden are:

Material	Pounds per Ton of Iron	Tons per Ton of Iron	Cost per Ton	Material Cost per Ton of Iron
Bauxite	2,175	0.97	$6.00	$5.80
Limestone	1,865	0.83	1.50	1.25
Borings	1,245	0.56	11.00	6.15
Ore	1,245	0.56	6.00	3.35
Coke	2,240	1.12	6.00	6.70
Cost of smelting				2.90
				$26.15
Value of Products:				
Alumina cement (not pulverized), 1.1 tons @ $30				$33.00
Pig iron, 1 ton				20.00
				$53.00

This gives an apparent margin of 100 per cent to cover grinding the cement, sale of the products, overhead and profit, even allowing no credit for surplus gas.

Fabricated Steel Structure for Mounting Circuit Breaker

A circuit breaker mounted in a fabricated steel structure designed to replace concrete has been brought out by Westinghouse Electric & Mfg. Co., East Pittsburgh. As the circuit breaker is built complete at the factory, the time and expense of installation are materially reduced by using the steel structure. As the apparatus is shipped as a unit, the time of preparing it for service is much less. It is only necessary to put the breaker in place, bolt it down, remove the blocking, check the adjustments, connect it to the control circuits and the bus, put in the oil, and it is ready for service.



Compactness Features This Fabricated Structure

As the operation of the breaker imposes shocks on the supports, the steel structure is better suited for this service. Steel, by its elastic characteristics, absorbs the shocks easily with no damage to itself. Although the structure shown exactly replaces a concrete structure, it is possible to reduce the space occupied by taking advantage of the greater strength of the steel. As the steel frame is lighter than the concrete structure, an indirect saving may be had in that the floors and building can be lightened for the decreased load.

In the structure shown the circuit breaker only is supported. The use of steel can be extended to support the disconnecting switches and further yet to support the bus.

Packard Company Grants Vacations to 2500

Plant and offices of the Packard Motor Car Co., Detroit, are shut down all of this week and next for the annual inventory period, and to allow vacations to such of the employees as are entitled to vacations according to the rules of the company, numbering upward of 2500. The company is taking advantage of this idle period to install new machinery and additional equipment which will enable it to resume operations July 2 at a higher rate of production than ever before.

Colorado Fuel & Iron Co. rail mills, which were scheduled for a seasonal shutdown about June 1, have continued in operation an additional two weeks as a result of a receipt of an order from the Texas & Pacific Railway for 10,000 tons. The rail department shutdown will take place about 30 days earlier than last year.

Poppet Valves Made in One Piece

Chrome-Silicon Alloy Rods Put Through Heading, Coining and Other Operations—Only ½-Oz. Variation in Weight Between Blank and Finished Valve

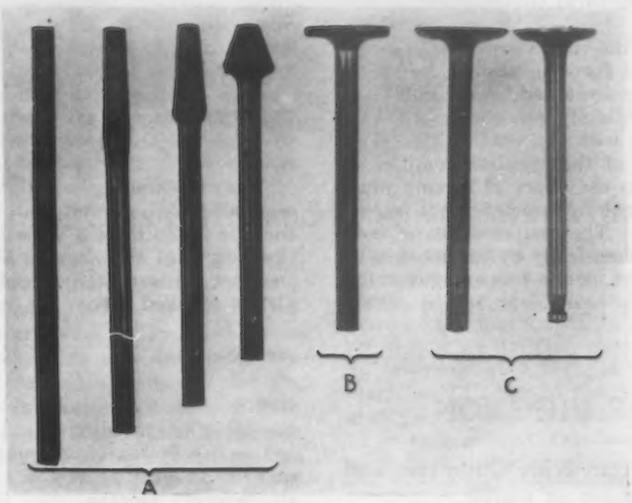
BY C. A. MC GRODER

HEADING machines and large coining presses are now employed by Dodge Brothers, Inc., Detroit, in producing a complete poppet valve from a single blank sheared from a drawn rod of chrome-silicon steel. Formerly the valve was made by electrically welding a stem of special alloy steel to a flat cast iron disk, which was also of special composition to resist the great heat to which the valves of internal combustion engines are subjected.

Now, the more recently developed chrome - silicon steel, known to the trade as "Silcrome," is used, the stem and the head being of the same heat-resisting material, and in one piece. Manufacture of the valves begins with heating the blanks at one end in a gas furnace and then feeding them, singly, by tongs, into a National heading machine which is equipped with four sets of dies and strikes four blows. The first three blows upset the stock which is to form the head, and prepare it for the final, flattening blow which completes the shape of the rough and slightly oversize valve.

It might be practical to machine or grind these rough blanks all over to the finished size of the valve were it not for the fact that chrome-silicon alloy is difficult to machine, even after annealing. It is in circumventing this difficulty that the new method effects its greatest economy in the next operation.

After being allowed to cool, the rough blanks are reheated in a gas furnace of the chain conveyor type which allows only the head of the valve to extend upward into the heated interior of the furnace. Coming out of this furnace at the correct temperature — somewhat lower than the 2300 deg. Fahr. required at the heading machines — the valve is dropped perpendicularly, with the head up, into the lower die of a



SEVEN Stages in the Manufacture of One-Piece Poppet Valves at the Plant of the Dodge Brothers, Inc. The sheared blank, at the extreme left in group A, is put through three upsetting operations, as indicated by the three pieces at the right of the sheared blank. The valve is then rough formed, as at B, by a fourth blow of the heading machine, the next operation being finish forming of the head of the valve in a coining press, the result of which is shown at the left in the group C. The finished valve, machined and ready for assembly, is at the extreme right, group C

IN Heading Machines, of the Type Shown at the Left, the Sheared Blanks Are Roughly Formed by Four Successive Blows, Preparatory to the Coining Press Operation Which Completes the Shaping of the Valves

TWO Large Coining Presses Compress the One-Piece Poppet Valve Almost to Size, the Beveled Under-Side of the Valve Being Formed in This Operation Also. Furnaces of chain conveyor type are used to heat the heads of the valves for the press operation

large Hamilton coining press. The head of the valve, including the beveled lower edge of the head, which must fit against the seat in the cylinder block, is then completely formed by the action of the press. The production from each coining press is 5000 valves in a 9-hr. day, and a heading machine can turn out approximately 4300 rough blanks in the same time.

From the coining press the valves are carried by electric trucks to the heat-treating department, where they are subjected to two heat treatments, in which electric furnaces are used. Placed in alloy steel trays, which measure about 18 x 50 in., the valves proceed through the first furnace and, after attaining a temperature of 1650 deg. Fahr., are cooled in air. This is an annealing treatment which relieves the metal of forging strains, effects structural changes and accomplishes a refining action.

After they have cooled, the valves are given a drawing treatment in the second furnace, where a temperature of 1220 deg. Fahr. is maintained. Emerging from this furnace, they are immediately quenched in oil, having had very little contact with the outside air. This sudden quenching, because of the peculiar qualities of the chrome-silicon steel, has the effect of leaving practically no scale on the metal to interfere with subsequent machining processes. The temperatures of both furnaces are controlled automatically by thermostats to within 10 deg., plus or minus, of the proper figure. Recording pyrometers keep a permanent record of the furnace temperatures, which are checked regularly by the metallurgical department.

Straightening the stem of the valve by rolling it between a moving and a stationary plate is the first operation in the machining department. The next step is to rough-grind the stem and trim the head and, later, to semi-finish grind the stem. The end of the stem is then hardened. To accomplish this the valves are placed head down in a tank of water with the stems extending about ½ in. above the surface. While in this position, the end of each stem is heated with an oxy-acetylene torch and allowed to cool by conduction of the heat through the stem into the water. This treatment gives a hardness of 55 to 60 on the Shore scleroscope.

A centerless grinder is used to finish the stem to size, within limits of plus 0.0000 and minus 0.0005 in., after which the stem is rolled under high pressure between hardened steel surfaces to produce a high finish. The last operation is grinding the beveled valve face. Final inspection is made with dial gages set to a piece of hardened and ground stock of correct diameter as master.

Notwithstanding all this machining, and the unavoidable loss of material in the forging operations, there is found to be a variation of only 0.03 lb. between the weight of the sheared blank of bar stock entering the first furnace at the heading machine and the completely finished valve.

SOURCES OF PIG IRON

Imports in 1927 Came from Nine Countries and Through 21 Ports of Entry

DETAILS of imports of pig iron into the United States in 1927 by countries of origin and individual ports of entry are covered in a table of the Iron and Steel Division, Department of Commerce. In THE IRON AGE of April 5 (page 953) appeared a similar table, except that ports of entry were shown by grand divisions, including the Atlantic, Gulf, Pacific and "other" ports. Of the total pig iron importations of 133,068 gross tons in 1927, India supplied one-half, or 66,627 tons. Philadelphia led by far as the greatest receiving port, taking a total of 63,810 tons.

From the table showing, by months, the tonnages entered at the various ports from the several supplying countries it appears that, in many instances, at least as between a given source and a given port, the inflow was spasmodic. Thus, Germany sent 700 tons into Massachusetts in January and 300 tons in November, making the total of 1000 tons. In cases where there was a fairly steady flow throughout the year that fact is indicated in our table, which is made up from the table prepared in the Department of Commerce; (a) indicates that some material was received during each of at least 11 of the 12 months; (b) in at least six different months.

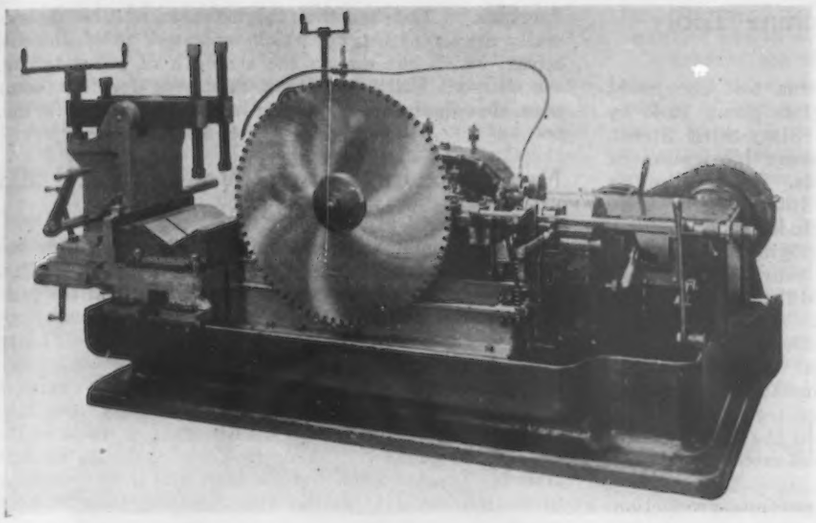
Heavy Increase in Farm Machinery

That there is a growing displacement of manual labor by farm equipment is indicated by a statement showing the increase in production of such equipment during the past two years. The Department of Commerce reports a 1927 output of tractors at 200,504, compared with 181,995 in 1926 and 167,553 in 1925. A much greater increase was shown in the number of harvester-thresher combination machines, which advanced from 5131 in 1925 to 11,760 in 1926 and to 18,307 in 1927. Among other items, the manufacture of which in 1927 showed increases over 1926, were various types of plows, including tractor plows, soil pulverizers and packers, grain drills, lime spreaders, potato-digging machines, hay rakes, hay loaders, ensilage cutters and silo fillers, corn shellers, lawn mowers and spray pumps.

IMPORTS OF PIG IRON INTO THE UNITED STATES—1927
(In Gross Tons)

Port of Entry	Total	Source of Supply: Belgium	France	Germany	Netherlands	Sweden	Great Britain	Canada	Mexico	India
Me. and N. H.	150	.....	.....	150	.....	.....	.....	.....	.....	.....
Massachusetts	13,700	.....	.....	1,000	5,306(a)	102	1,131	.....	.....	6,161(b)
Buffalo	225	.....	.....	.....	.....	.....	.....	225	.....	.....
New York	15,276	.....	.....	44	9,043(b)	448(b)	3	.....	.....	5,738
Philadelphia	63,810	100	3,000	3,637	6,112(a)	173	19,405(b)	.....	.....	31,383(b)
Maryland	13,185	.....	.....	1,200	3,883(b)	677	100	.....	.....	7,325(b)
Virginia	1,660	.....	.....	.....	450	.....	.....	.....	.....	1,210
North Carolina	1,000	.....	.....	.....	1,000	.....	.....	.....	.....	.....
Florida	250	.....	.....	250	.....	.....	.....	.....	.....	.....
New Orleans	750	.....	.....	750	.....	.....	.....	.....	.....	.....
Galveston	3,409	.....	.....	75	80	.....	100	.....	.....	3,154(b)
San Antonio	72	.....	.....	.....	.....	.....	.....	.....	72	.....
El Paso	25	.....	.....	.....	.....	.....	.....	.....	25	.....
Los Angeles	7,092	49	.....	685	2,832(a)	300	.....	.....	.....	3,226(b)
San Francisco	8,465	350	.....	610	250	.....	.....	.....	.....	7,255(b)
Oregon	867	.....	.....	100	300	.....	.....	.....	.....	467
Washington	1,498	.....	.....	710	124	.....	230	28	.....	406
Hawaii	1,002	200	.....	500	.....	.....	.....	.....	.....	302
Montana and Idaho	56	.....	.....	.....	.....	.....	.....	56	.....	.....
Michigan	416	.....	.....	.....	.....	.....	.....	416	.....	.....
St. Louis	160	.....	.....	.....	.....	.....	160	.....	.....	.....
Total	133,068	699	3,000	9,711(a)	29,380(a)	1,700(b)	21,129(b)	725(b)	97	66,627(a)

(a) Material coming in during practically every month of the year.
(b) Material received in at least six of the 12 months.



With a 42-In. Blade, 5/16-In. Kerf, 15-In. Low Carbon Steel Bars Were Cut in 10 Min. Twelve feed changes, ranging from ¾ to 3¾ in., and three speeds are obtainable. Either a 42 or 48-in. blade may be used

Sawing Machine Cuts 18-In. and Smaller Bars Without Turning

ACCURATE and economical cutting of bars up to 18 in. in diameter is claimed for a new metal sawing machine, which is being placed on the market by the Cochrane-Bly Co., Rochester, N. Y. The machine is designed to use either a 42-in. or a 48-in. blade; the former saw blade will cut through a 15-in. bar and the latter an 18-in. bar, without turning.

The arrangement of the machine, which is built to modern machine tool standards, may be noted from the accompanying illustration. The saw arbor is 6 in. in diameter, is hardened and ground and is fitted with adjustable taper gibs to compensate for wear. The bed of the machine is scraped to surface plates. The feed screw is mounted above the ways, in line with the center of the saw arbor and close up to the saw blade, to eliminate vibration due to cant or side pull.

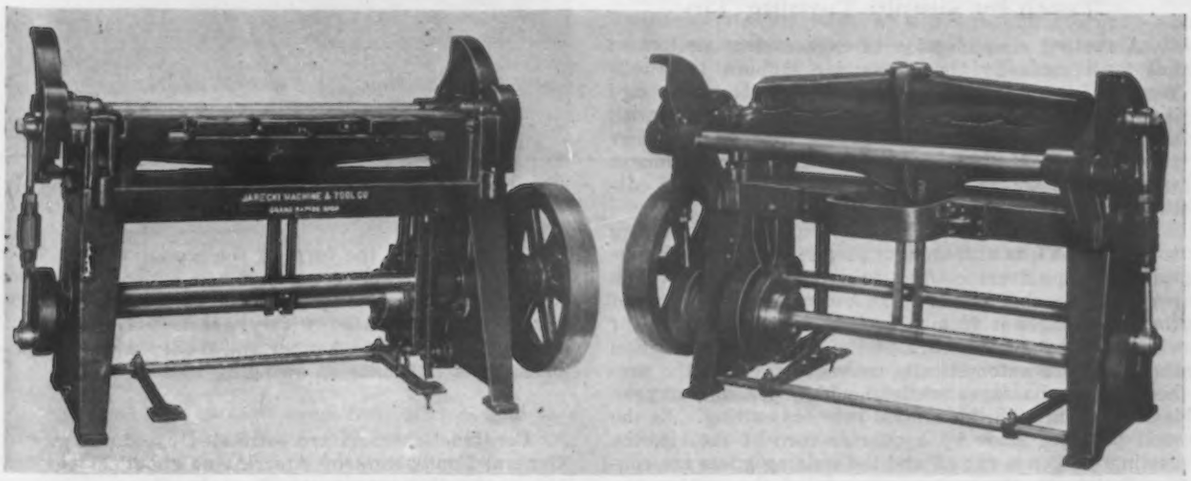
Feeds are geared and positive, and 12 changes of feed, ranging from ¾ to 3¾ in. per min., are obtainable. The machine is driven through a hardened nickel steel arbor gear and pinion having herringbone teeth and running in oil. The worm is of hardened steel and the worm wheel of phosphor bronze. Sliding gear transmission, using steel gears which run in oil, give speed changes of 45, 60 and 75 ft. per min. The initial drive of the machine is by a 25-hp. constant-speed motor through a friction clutch. The clutch is controlled by levers located both at the front and rear of the machine, adjacent to the levers and cranks for start, stop and reverse of feeds and adjustment of the carriage to and from the work. The friction clutch permits quick stopping of the saw blade without stopping the motor, and eliminates the chance of damaging the blade by moving a loose bar in the blade while the blade is in motion. Adjustable collars are provided to stop and reverse the feed automatically, giving quick return of the carriage to a point where the blade clears the bar being cut. The floor space required by the belt-driven machine is 69 x 141 in. and of the motor-driven machine, 84 x 141 in.

It is claimed that in recent tests of the machine 15-in. bars of low-carbon steel were cut in 10 min., 10-in. bars in 4½ min. and 6-in. bars in 1¾ min. The saw blade used was 42 in. in diameter with 5/16-in. kerf.

New Sheet Metal Folding Machine

A NEW power folder, designed for folding sheet metal up to No. 16 gage over the entire length of the machine, has been brought out by the Jarecki Machine & Tool Co., Grand Rapids, Mich.

A feature is the provision of a center bearing to take up spring of the machine, which is said to hit just as hard in the center of the sheet as it will on the ends close to the bearing. The machine is connected at both ends of the shaft so that an even distribution of power is obtained and twisting action while folding is eliminated. Material up to 42 in. in length can be folded on the standard machine, but machines for longer material can be furnished. In the larger machines a number of hinge bearings can be incorporated to offset springing of the machine. Either belt or motor drive arrangement can be furnished. The flywheel is 24 in. in diameter, weighs 250 lb. and runs at 100 r.p.m. The ratio of gearing is 3 to 1. The floor space occupied is 30 x 72 in. and the height of the machine is 42 in. The weight is approximately 2400 lb.



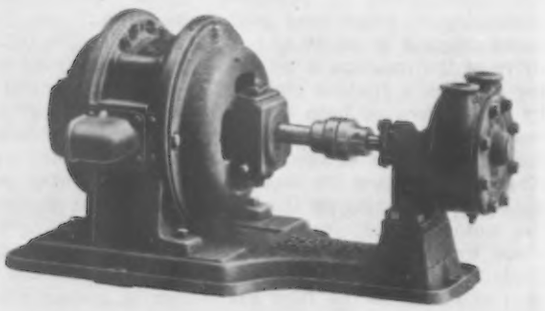
No. 16 Gage Sheets Up to 42 In. Long Can Be Folded on the Standard Machine. Provision is made to eliminate twisting action while folding

Small Pumps for Machine Tool Lubrication

A recent development in machine tool equipment is a small, high-pressure, packingless pump built by the Tuthill Pump Co., 131 West Sixty-third Street, Chicago. It is designed for pressure lubrication of machinery and for hydraulic feeds. Like all other Tuthill pumps, it operates on the internal gear principle. However, the new pump (Model B) includes a two-zone packingless feature, employing a new patented metallic seal which is said to insure freedom from leakage at pressures as high as 500 lb. per sq. in. and 28 in. of vacuum on lubricating oil.

Two sizes of Model B are available, 30 gal. capacity an hour, and 90 gal. at 1800 r.p.m. Either size may be obtained with either the foot mounting (illustrated) or the flange mounting. The flange mounting is convenient when the pump is built into the machine, and it also offers the possibility of a neat motor-drive unit. The body is about 4 in. long.

Another Tuthill model recently put into production, is the Model C pump. This is for pressures up to 200 lb. on lubricating oil and was designed to cover the demand for a reasonably priced high-pressure pump. Pumps of this model can be furnished for belt drive or direct motor drive in capacities of 1½ to 45½ gal. per minute.



Model B Pump (at Right) Is Exceptionally Compact, for Machine-Tool Lubrication. Above is shown Model C, a larger pump for high pressure

Welding Blowpipe Changed to Cutting Torch by Simply Turning Tip

A further simplification of oxyacetylene equipment has been made by the Alexander Milburn Co., 1416 West Baltimore Street, Baltimore, Md. Not long ago it was necessary to have two complete torches with separate kits of copper tips, one for welding, the other for cutting. A step in advance was an attachment whereby the welding blowpipe could be used for cutting, as occasion warranted.

The new Milburn combination cutting and welding torch, type TI, is still another step forward. To change this blowpipe from cutting to welding it is not even necessary to change the tip. A convertible feature of the tip changes it from a cutting to a welding tip or vice versa by a mere turn of the tip. In one position the gases are automatically conveyed through the preheating gas passages while the high pressure oxygen is carried through the central hole for cutting. In the next position, made by a quarter turn of the tip, the cutting oxygen is cut off and the welding gases are conveyed through the central passage of the cutting tip, making a correct welding flame.

Torch heads, valves, bases and other parts are bronze forgings. The seamless high-pressure tube is specially drawn with triple thick walls and is of nickeled silver, which has double the strength of brass tubing. As with all Milburn torches, flashback does not occur even though the tip should be inserted in molten metal.

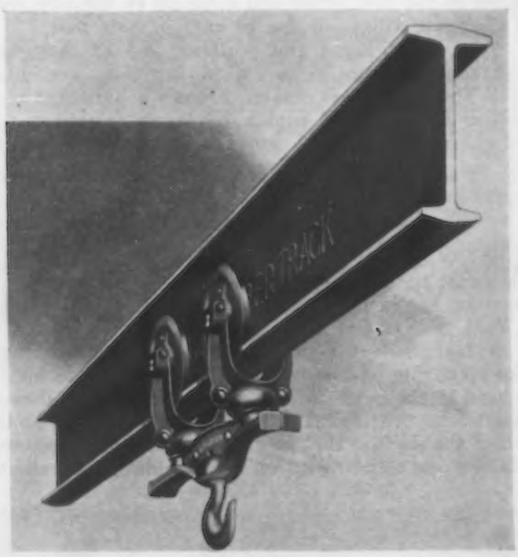
New Flux for Bronze Welding Steel and Cast Iron

A new combination of fluxes for bronze welding has been devised by Simplex Flux & Solder Co., 1965 East Sixty-sixth Street, Cleveland. By this method the joint in steel or cast iron is first heated with an oxyacetylene blowpipe to just above a black heat, and some "Lotan Powder" is sprinkled over the hot spot. Moderate heating is continued until this powder sparkles and adheres firmly to the hot surface. After the joint has been prepared in this manner, a bronze weld is made in the usual way, using "Lotan A. B. Flux," namely, by first tinning a portion of the surface and then puddling in molten metal from the rod until the joint is built up the required amount. This method is said to give a superior union between the iron or steel and the added bronze at the joint.

Overhead Track for Industrial Use

With a carrying capacity of 3000 lb., a new overhead trolley track of special section has been brought out by the Louden Machinery Co., Fairfield, Iowa. This is for use on monorail systems and is designated the Louden super-track. The section is about 6 in. deep, with a 3-in. flange at top and a 2-in. flange at bottom, as illustrated. Special features distinguish the new two-way, three-way, cross-track and turntable switches designed for use with this system.

It is emphasized that the track is not of ordinary I-beam, but is specially rolled from steel billets of 0.50 to 0.60 per cent carbon, and is unusually tough. The upper flange provides a gripping surface for supporting hangers, while the lower flange constitutes the track for twin trolley wheels.



Special Section Rolled for Monorail Track of Unusual Toughness

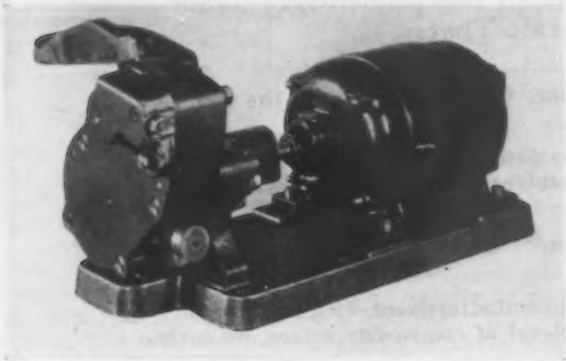
It is said that the form of the section eliminates in large measure the necessity for a supporting superstructure. The stiffness of the section permits the hangers to be spaced widely apart. There is sufficient space between hanger and trolley wheels to provide ample clearance on swinging loads.

Construction costs are estimated by the Associated General Contractors of America at about 96 per cent above the 1913 average. There has been no change through three months and only one change since the drop to 99 per cent was made in November.

Bench Machine for Shearing 10 Gage and Lighter Cold Rolled Sheets

A new shearing machine for straight, circular and irregular cutting of cold rolled steel up to No. 10 gage, 9/64 in., and softer materials in proportion, has been added to the line of the Unishear Co., 270 Lafayette Street, New York.

In principles of design the new machine, which is designated as the Model A-10 and is illustrated herewith, is the same as the company's former machines, previously described. On cold rolled steel, cutting speeds up to 10 ft. per min. are obtainable and it is



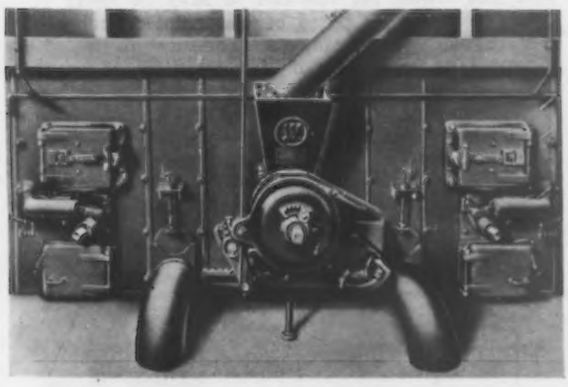
The Cutting of No. 10 Gage Material Is at the Rate of 10 Ft. Per Min.

claimed that the cutting is without burr or distortion, so that time lost in filing or trimming down the work is eliminated. Notches and angles may be cut conveniently.

A ¾-hp. motor, either direct or alternating current as required, is employed, and suitable starters are available. The motor and shear unit are mounted on a baseplate, for bench mounting, and direct-connected by flexible coupling, as shown. A sheet stabilizing device, located adjacent to the shear blade, is regular equipment. Cutters are of special alloy steel and have straight edges, which facilitates sharpening. The net weight of the machine is 165 lb.

Underfeed Stoker for Annealing and Other Industrial Furnaces

A new single-retort underfeed stoker for industrial furnaces, developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has the flexible grate motion in combination with power-operated dumps which features its stokers for furnaces of wide dimen-



Annealing Furnace Fired by Stoker

sions. The illustration shows such an application to the side of an annealing furnace. The firebox extends practically the whole furnace length, thus insuring uniform heat distribution.

An adjustable ratchet screw feed delivers coal to a center retort. An eccentric on the screw shaft imparts motion through a slotted sector lever and cross-connecting link to the grate rocker shafts located on each side of and adjacent to the retort. The motion on either side is independently regulated to any desired degree from minimum to maximum. The ratchet wheel and eccentric run in an oil bath in a dust-proof case.

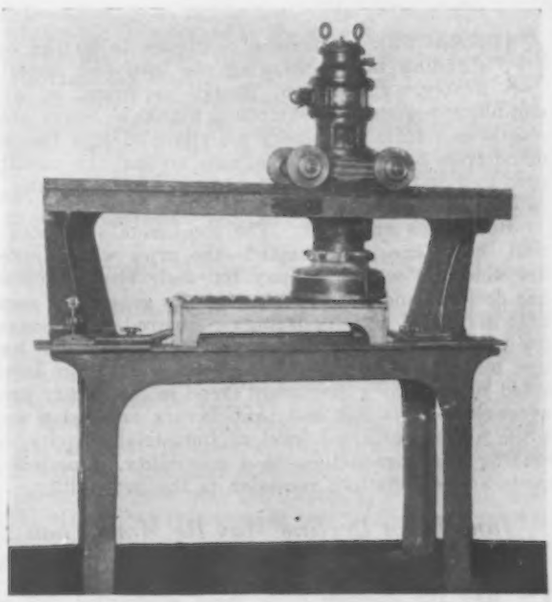
Furnaces for the heat-treating of steel essentially require a thick fuel bed. The flexibility of the grate motion of this stoker effectively handles a heavy fuel mass from the retort to the dump. The dumps are actuated by single-acting plungers operated by steam or air pressure. A weighted lever automatically unlocks the dump lever arm and, upon releasing the pressure, the dump is lowered. Disengaging the weight from the lever and again applying pressure raises the dump and automatically locks it in normal position.

Complete flexibility of coal feed and distribution, combined with an easy and expeditious means of dumping the refuse, enables the operator to maintain uniform temperature under the desired conditions of furnace atmosphere throughout the heating cycle.

Standard Machine for Grinding Cores

Equipment designed specifically for grinding cores, brought out recently by the Stoney Foundry Engineering & Equipment Co., 5101 Lakeside Avenue, Cleveland, is shown in the accompanying illustration.

The machine is of simple construction and resembles, in general appearance, a vertical surface grinder. It consists of a rigid cast iron bed to which is bolted an overhead member that has V-ways upon which the wheels of the grinding-head carriage ride. The grind-



With the Cores Loaded in the Fixture, Grinding Is Accomplished by Hand Traversing the Grinding-Head

ing-head is equipped with a ½-hp. 900-r.p.m. motor which is connected by a shaft of special design, and with special bearings, to a 12-in. diameter cup-type grinding wheel. The cores are held in fixtures on the table of the machine, the fixtures being clamped by the strips shown at each side of the fixture. The clamping is by hand by means of the hand knobs shown. For the heavier classes of cores the fixtures are held by bolts in T-slots machined in the table.

With the fixture loaded the cores are ground by hand traversing of the grinding-head. The maximum length of travel of the grinding wheel head is 3 ft., within which distance at the left-hand end of the machine is located the device for dressing the grinding wheel. The minimum height from the table at which the cores may be ground is 4 in. and the maximum height is 6 in., but the latter may be increased to 10 in. by placing filler plates between the table and the brackets carrying the overhead ways.

Vertical adjustment of the head in increments of 0.005 in. is provided. The height of the table from the floor is 34 in. The carriage is mounted on roller bearings and is lubricated by means of Alemite fittings. Means are provided for convenient removal and mounting of grinding wheels.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Current Statistical Data, Considered Independently of Trade Opinion, Indicate That:

Steel ingot output is likely, during June, to show more than the normal 6 per cent drop from May.

Unfilled orders showed in May a continuation of the heavy decrease registered in April and, except for last year, made the poorest May 31 showing in many years.

Pig iron production is in close adjustment with ingot output; prices are decidedly low.

Finished steel prices are in considerable maladjustment with semi-finished products; in common with the general level of commodity prices, no early improvement is indicated.

CHARACTER of demand continues to be the outstanding fact concerning the iron and steel industry. Production, though declining, is large and above normal. Consumption, thanks to heavy automobile and farm machinery activity and to a fair demand from building, is large, also, so that the quantity produced and the quantity consumed are apparently in rather close adjustment.

But prices are weak. The conclusion suggested is that the *intensity* of demand—the price which buyers are able and willing to pay for their requirements—has declined and is relatively low. In general, it seems that industrial activity is high compared with demand for products, resulting in severe competition and narrow margins of profit. This condition has been intensified recently by a downward trend in commodity price averages. It is not one that favors expansion and, while a well-sustained level of industrial activity, including steel production, is a possibility, a period of moderate but distinct recession is the probability.

June Ingot Decline May Be More Than Normal

IN May the average daily ingot production fell off more than usual for the month. Consequently our adjusted index shows what may be called a sharp reversal of trend, the decline being so pronounced that, with production still above normal, a continuation of the trend toward curtailment is indicated. Anyhow, such movements have a certain momentum. A decline of about 6 per cent in the average daily output would be normal for June, and the reduction during the current month should be somewhat greater than that, bringing the average daily figure to some such rate (allowing for seasonal conditions) as obtained through the first quarter.

Aside from the general business uncertainty which now prevails, the foregoing conclusion is strengthened by the declining trend of our P-V line, and by the slackening in the volume of new business as reflected in the large decline in the unfilled orders of the Steel Corporation.

Steel production in May, according to our estimates, was about 10 per cent above the normal requirements of the country, the adjusted index being 110.3. Of course, the actual requirements may be above normal and such has been the case during the first half of 1928, owing to the considerable expansion in the output of automobiles and farm equipment and in building activity. Steel production, therefore, while 10 per cent above normal, has not been 10 per cent excessive. But our composite demand line, published last week, shows the existence of some over-production and the action of the unfilled orders and prices is conclusive to that effect.

Unfilled orders of the Steel Corporation, at 3,417,000 tons, were the lowest since last October and, except for a year ago (when the figure was 3,051,000 tons), were the lowest for the end of May in many years. It is the declining trend of the unfilled orders, however, that is most significant. The total decline of over 900,000 tons in April and May has been the sharpest since the same months in 1924.

Such declines indicate a recession in the volume of new business and usually bring curtailed production and weakness in prices. The situation today lacks some of the elements of weakness found in 1924: prices are not so high, the activity (and presumably the requirements) of the chief consuming industries has held up

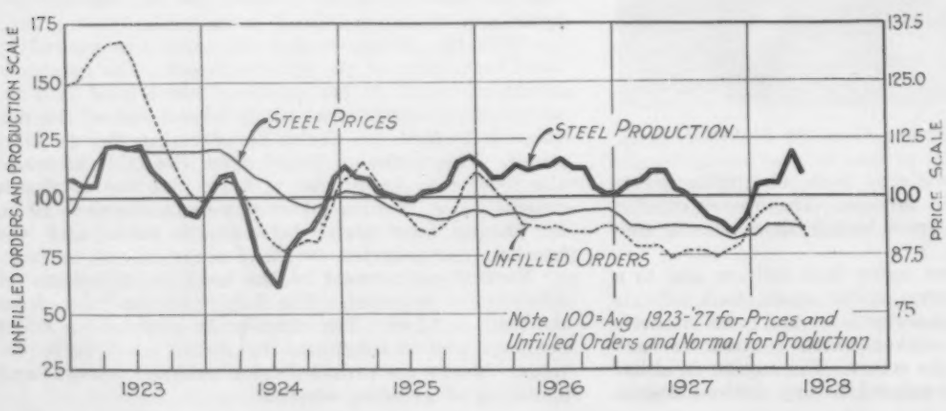


Fig. 1—Steel Production in May Was 10 Per Cent Above Normal Requirements. Prices have been sagging. Unfilled orders are much lower, showing declining demand

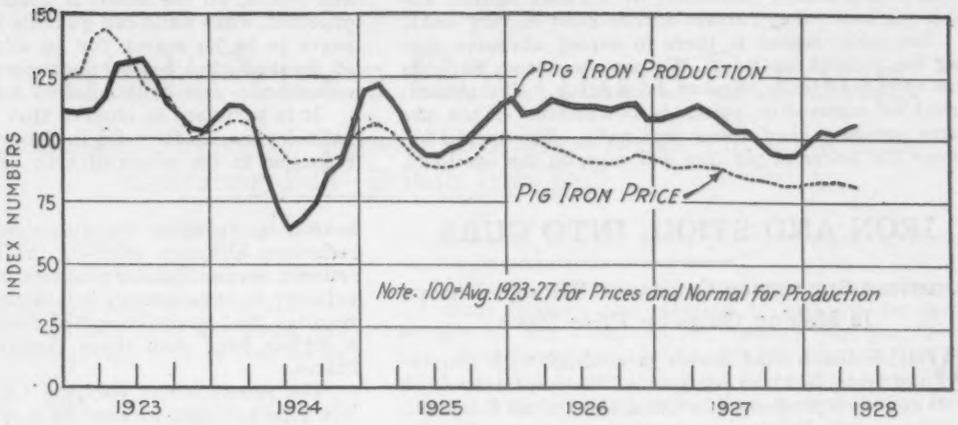


Fig. 2—Firmness in Pig Iron Prices Would Be Logical, with Pig Iron Output Relatively Below Steel. But pig iron is decidedly cheap and there is no indication of immediate improvement

better, and pig iron production is in better adjustment with steel production. But the existing situation, nevertheless, has the earmarks of a recession and already production and prices have declined.

During May the average price of finished steel was 2.350c., which compares with 2.359c. in April and 2.360c. a year ago. The May average is only 93 per cent of the average for the years 1923-1927. At this writing, THE IRON AGE composite price is 2.341c. and seems likely to go a little lower.

Broad Decline Continues in Pig Iron Prices

IT is notable that the trend of a 12-month moving average of pig iron prices continues steadily downward, showing no sustained interruption of the broad decline which has gone on during recent years. Each successive recovery has been less vigorous than its predecessor and has been followed by a new low point. At this writing THE IRON AGE composite average has fallen to $17.23, against a May average of $17.45. A year ago the May figure was $19.09.

At the same time, the annual rate of increase in pig iron production has become smaller; that is, the pig iron output has increased at a less rapid rate than formerly. In revising our trend line at the beginning of the year we noted this, and the reader will observe that the successive rises in production above the estimated normal line have been less marked of late. Evidently a broad change in the industry is reflected, less pig iron being used in proportion to the steel made, and this development may have something to do with the downward trend of pig iron prices.

In May, the average daily output of pig iron was 105,900 tons, against 106,200 tons in April. This small decrease was less than usually occurs between the two months and our adjusted index rose to 106.8 per cent of normal, against 105.2 per cent in April. A year ago the index was 111. Thus pig iron production is less than 7 per cent above normal, in comparison with a steel production which is over 10 per cent above normal. This means a low ratio of pig iron output to steel production and would ordinarily bring a stronger price for the former. There is no indication, however, of such a development in the near future.

For one thing, pig iron production increased in May and gained on steel production. The ratio of the average daily pig iron output to the average daily steel output was the highest since last December—too high, *considering the level of steel prices.* Pig iron is and has been rather cheap in comparison with finished steel prices, but judged by the standards of recent years its price is only about right in comparison with steel scrap. And in view of the decline in steel prices, and the weakness in scrap, no ground for strength in pig iron prices is to be found here.

Maladjustment Among Iron and Steel Prices

THE price structure in the iron and steel industry has recently been seriously out of adjustment. Not only billets but bars are too high, in comparison either with such items of finished steel as sheets and nails, or with such raw materials as coke and pig iron. Theoretically it would seem that either billets and bars must be marked down in price, or that both (1) sheets and nails and (2) coal and coke must be marked up.

Of course, technical conditions may have changed sufficiently in the last year or two to affect the normal spreads among these items, but insofar as we know the situation, advances in price do not seem probable either in finished steel or in the raw materials. Coal and

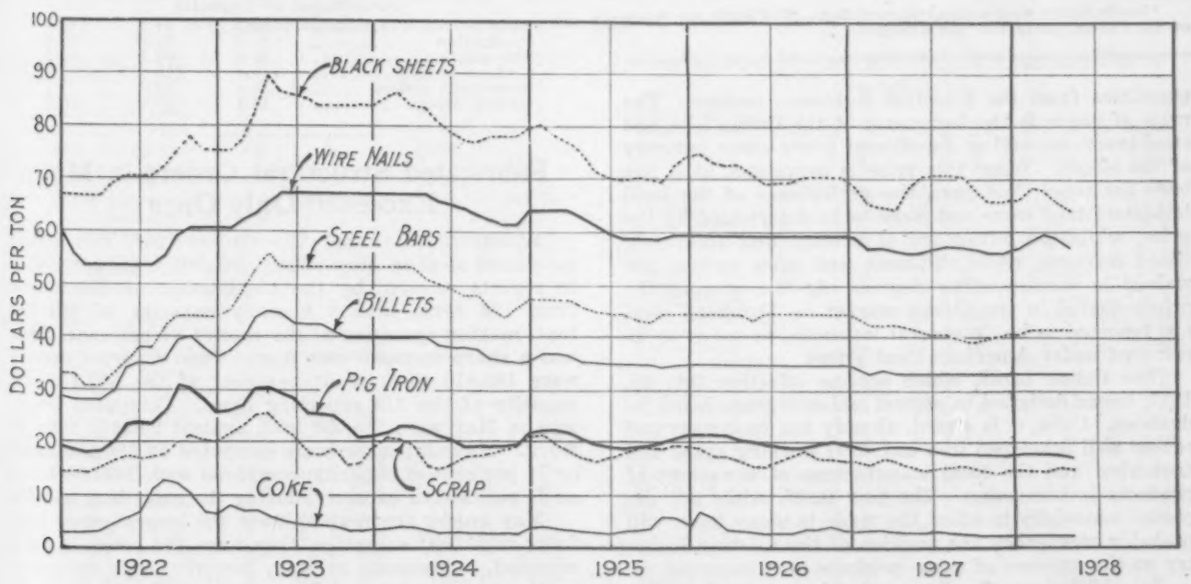


Fig. 3—Finished Steel Prices (in Particular, Sheets and Nails) Are Relatively Low, Compared with Semi-Finished and Raw Materials. But supplies are more abundant than demand and sustained improvement is not indicated

coke, it is true, are practically at bed rock figures, and so is pig iron. Any further decline must be very small.

But what reason is there to expect advances during the present quarter? We can see none. Supplies are abundant while demand is sagging. The general trend of commodity prices is downward. Much the same can be said of sheets and nails. The spread between the prices of pig iron and coke, on the one hand, and sheets, on the other, is about as small as can be expected, while nails can go little lower. But there appears to be no reason for an advance in these items of finished steel before September, at least. Thus a reduction in semi-finished steel appears to be in order.

It is pertinent to observe that rarely do sheets and nails decline, as they did in April and May, without a reduction in the prices of both bars and billets.

IRON AND STEEL INTO CUBA

American Supremacy Continues, Though Europe Is Making Gains on Price Basis

WHILE the United States is credited with supplying from 75 to 90 per cent of the importations of iron and steel products into Cuba, the United Kingdom, Germany, and Belgium in particular, are steadily increasing their proportionate share, according to a report transmitted by Charles F. Payne, vice-consul, Havana. The statement shows importations into the Havana district by metric tons for the calendar years 1924-1927, inclusive, and affords a good index of the total importations, because of the outstanding importance of this district and port in Cuban trade and industry.

Of the total Cuban importations of iron and steel in 1926, amounting to 118,342 tons, 88,558 tons or 74.8 per cent entered the Havana district, while in 1925 75 per cent went through the Havana district. The total importations for 1927 have not yet been received, but the movement through the Havana district was 90,836 tons, or 2 per cent ahead of 1926.

At one time, it is pointed out, all iron and steel imported into Cuba came from the United States. But the past three years have indicated an increasing tendency on the part of local consumers to import greater quantities from the principal European makers. The price of sugar is the barometer of the Cuban iron and steel trade, as well as for almost every other industry of the island. When this price is depressed, as it has been for some time past, the preferences of the local importers tend more and more to be determined by the price, while the advantage of prompt and accurately timed delivery, rapid shipment and sales service are waived in corresponding degree. At the moment the prices quoted in the Cuban market on European steel are reported to be, in several instances, as much as 25 per cent under American steel prices.

Imports of Iron and Steel Products into the Havana Consular District
(In Metric Tons)

Products	1927*	1926	1925	1924
Pig iron	1,352	1,326	478	354
Iron bars, beams, etc. (cast)	4,492	6,502	6,498	5,544
Other manufactures of iron (cast)	3,760	3,817	6,236	5,719
Iron and steel bars and rods	29,200	39,631	37,867	37,296
Plates and sheets	11,894	7,575	8,843	7,973
Wire and cable	3,154	3,233	3,112	2,426
Iron and steel (in pieces)	4,721	1,757	1,547	1,291
Galvanized sheets	4,684	2,755	5,803	5,460
Manufactures of galvanized iron	634	462	604	1,034
Metal screen	213	92	59	320
Pipe and fittings	7,699	5,940	6,896	4,329
Rails	5,686	2,500	3,484	5,989
Other manufacturers	13,347	12,968	16,381	17,239
Total	90,836	88,558	97,808	94,974
Total Cuban imports	....	118,342	130,195	176,395
Percentage through Havana	....	74.8	75.0	53.8

*Preliminary and subject to revision. Statistics for trade of all Cuban ports not yet available.

The Cuban tariff, which became effective Oct. 25, 1927, seems designed to protect and encourage home industries. Cuba, it is stated, already has important and rather well developed iron and steel working shops and foundries, and the local manufacture of a variety of products is increasing. The new tariff, while not expected materially to affect the trade in many lines, will probably strengthen the position of the existing industry at the expense of some products now imported.

In addition to affording protection to the local industry, the new tariff encourages the importation of a number of products, such as wrought pipe, bars and beams, by reducing the duties borne by them. This reduction, although affecting the importation from all sources, seems to favor products of the European steel industry to some extent, it is declared, although it still requires that goods imported from the Continent pay a higher duty than those received from the United States.

The report states that the Cuban market for cast iron pipe has been invaded by a type of pipe of Italian manufacture—consisting principally of cement and asbestos—which, it is held, enjoys the dual advantage of lower price than its competitor together with, it is claimed, a much longer life. Several installations of this pipe are said to have been made already.

Iron and steel bars and rods constitute the largest items of importation into Cuba, with plates and sheets in second position. These two made up about 45 per cent of the 1927 entry, against 53 per cent in 1926.

SHEET STEEL SALES

May Off 12 Per Cent from April and Unfilled Orders 15 Per Cent

SHIPMENTS of sheet steel during May held up close to the April rate, being 326,324 tons for the month as compared with 327,674 tons for April, according to the monthly report of the Sheet Division of the National Association of Flat Rolled Steel Manufacturers, 511 Terminal Tower Building, Cleveland. However, shipments exceeded sales by 76,008 tons. Sales for the month were 250,316 tons, a loss of 33,754 tons as compared with April, the decline evidently reflecting a slackening in the demand from the automotive industry. While sales fell off, production increased 21,458 tons and exceeded shipments by 23,043 tons. Unfilled orders on June 1 were 527,477 tons, a decrease of 44,284 tons from May 1. The May report and comparisons follow:

	May	April	March
Total number of mills	721	721	721
Capacity per month	506,000	464,422	492,150
Percentage reporting	72.2	72.2	72.3
Sales	250,316	284,070	399,441
Production	349,367	327,909	366,127
Shipments	326,324	327,674	359,532
Unfilled orders	527,477	571,761	675,196
Unshipped orders	112,664	109,200	110,702
Unsold stocks	54,047	53,853	53,144
Percentages of Capacity			
Sales	68.5	84.7	112.4
Production	95.6	97.8	103.0
Shipments	89.3	97.7	101.1
Unfilled orders	170.4	170.4	189.9
Unshipped orders	30.8	32.6	31.1
Unsold stocks	14.8	16.0	15.0

Fabricated Structural Orders in May Exceeded Only Once

WASHINGTON, June 19.—Orders for fabricated structural steel in May totaled 246,963 tons, according to reports received by the Department of Commerce from 196 firms with a monthly capacity of 294,435 tons, making operation at the rate of 84 per cent. This was a sharp increase over April, when reported orders were 189,873 tons, or 63 per cent of the 302,175-ton capacity of the 218 reporting firms. Computed bookings in May were 315,000 tons, against 236,250 tons in April. May shipments were computed at 266,250 tons, or 71 per cent of capacity, compared with 240,000 tons, or 64 per cent of capacity, during the preceding month.

May orders (computed) were the largest since last July; with that exception, they were the greatest ever reported. Shipments in May, however, were exceeded by those of August and September, 1927, and those of June, 1926, and were closely approached by the 265,350 tons of October, 1925.

Continental Prices Continue Strong

Consumers Cautious in Buying for Forward Delivery—Welsh Tin Plate Mills Operating Full—British Iron Dull

(*By Cable*)

LONDON, ENGLAND, June 18.

CLEVELAND pig iron business is at a low ebb, but makers' order books are well filled and prices are being maintained. Scottish output is to be reduced by blowing out more furnaces.

Hematite continues dull. The Consett Iron Co. has blown out one furnace and prices are sagging as a result of extensive stocks. Foreign ore is quiet but the price of Bilbao Rubio is well maintained through continuance of the Swedish strike and an advance appears likely.

Finished iron and steel is generally quiet with but little export demand of a substantial nature. Nasmyth, Wilson & Co., however, have secured a contract for 18 locomotives for India. New shipbuilding contracts are scarce, but constructors of dwellings and engineering plants are moderately active. Baldwins, Ltd., has announced a financial reconstruction plan, involving writing off nearly £4,000,000 of capital. This reorganization is believed to be the forerunner of other similar developments.

Tin plate continues active and with prices advancing many makers are refusing to sell for forward delivery at less than 18s. 6d. ($4.51) per base box, f.o.b. works port and 18s. 9d. ($4.58) per base box is being paid for prompt shipment. Demand is well distributed and works are operating at practically full capacity.

Galvanized sheets are quiet. Far Eastern demand for black sheets has slackened, but works are well sold ahead.

Demand in Continental iron and steel market is light and some prices are weakening slightly, but makers' order books are generally well filled for three to four months and consumers are cautious in making forward commitments. There is a heavy demand for Welsh tin plate bars and official prices are unchanged, but some sellers are asking up to £6 5s. ($30.44) per ton delivered and foreign bars are quoted at £5 12s. 6d. ($27.40), but deliveries are extended.

British Pig Iron Firm but Steel Market Is Depressed

LONDON, ENGLAND, June 8.—The iron and steel market has continued dull, and, with the exception of tin plate, which continues active, the volume of business is only meager. Business was curtailed by the Whitsun holiday and, since then, depression, particularly in pig iron, has become more acute. Production of pig iron is declining steadily, and the output on the Northeast coast in April was only 168,000 tons, with steel production at 142,800 tons, while exports from the Tees in May were 16,300 tons of pig iron and 55,000 tons of steel.

The producers of Cleveland pig iron are perhaps in a better position than their competitors, as their books are moderately well filled and their output is restricted, while competition from Continental makers is less severe, as European prices have been advanced. Nevertheless, purchasing by domestic foundries is small and demand for hematite iron by steel makers is at a minimum. Hematite stocks are large, one maker alone having 50,000 tons in his yards, so that there is not much stability to prices, but Cleveland producers of foundry and forge iron are able to hold their own.

In semi-finished material there has been some improvement, as the margin between the prices of British and foreign material has been reduced by increased Continental costs. Makers of Welsh tin plate bars, following the revival in the tin plate market, have booked a large tonnage, but, because of the dullness in the heavy steel trade, there is an acute shortage of scrap. This has made the tin plate bar market very strong, and, as a result, tin plate is firm, with prices likely to advance.

The volume of new shipbuilding contracts being placed is smaller than the amount of work being executed, and plate mills are feeling the depression. No

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	17½s.	to	£0	17¾s.	$4.27	to	$4.33
Bilbao Rubio ore*	1	2½				5.48		
Cleveland No. 1 fdy.	3	8½				16.56		
Cleveland No. 3 fdy.	3	6				16.07		
Cleveland No. 4 fdy.	3	5				15.83		
Cleveland No. 4 forge	3	4½				15.71		
Cleveland basic (nom.)	3	5				15.83		
East Coast mixed	3	9	to	£3	10s.	16.81	to	$17.05
East Coast hematite	3	10½				17.17		
Rails, 60 lb. and up	7	15	to	8	0	37.75	to	38.96
Billets	6	5	to	6	15	30.44	to	32.88
Ferromanganese	13	15				66.97		
Ferromanganese (export)	13	0	to	13	5	63.31	to	64.53
Sheet and tin plate bars, Welsh	6	0				29.22		
Tin plate, base box	0	18½	to	0	18¾	4.51	to	4.58
Black sheets, Japanese specifications	13	7½				65.14		
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.66	to	1.77
Boiler plates	9	0	to	10	10	1.95	to	2.28
Tees	8	2½	to	8	12½	1.77	to	1.99
Channels	7	7½	to	7	17½	1.60	to	1.71
Beams	7	2½	to	7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to	1.69
Steel hoops	9	0	to	10	0	1.95	to	2.17
Black sheets, 24 gage	9	15	to	9	17½	2.12	to	2.14
Galv. sheets, 24 gage	13	5	to	13	7½	2.88	to	2.95
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to	3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):								
Belgium	£3	3s.	to	£3	5s.	$15.34	to	$15.83
France	3	3	to	3	5	15.34	to	15.83
Luxemburg	3	3	to	3	5	15.34	to	15.83
Basic pig iron (nom.)								
Belgium	3	0	to	3	1	14.61	to	14.85
France	3	0	to	3	1	14.61	to	14.85
Luxemburg	3	0	to	3	1	14.61	to	14.85
Coke	0	18				4.39		
Billets:								
Belgium	4	15				23.14		
France	4	15				23.14		
Merchant bars:						C. per Lb.		
Belgium	5	14	to	5	16	1.26	to	1.28
France	5	14	to	5	16	1.26	to	1.28
Luxemburg	5	14	to	5	16	1.26	to	1.28
Joists (beams):								
Belgium	4	18½	to	5	0	1.08	to	1.10
France	4	18½	to	5	0	1.08	to	1.10
Luxemburg	4	18½	to	5	0	1.08	to	1.10
Angles:								
Belgium	5	10	to	5	12½	1.21	to	1.23
¼-in. plate:								
Belgium (a)	6	12½				1.45		
Germany (a)	6	12½				1.45		
⅜-in. ship plate:								
Belgium	6	8				1.41		
Luxemburg	6	8				1.41		
Sheets, heavy:								
Belgium	6	1				1.34		
Germany	6	1				1.34		

(a) Nominal.

improvement is evident in the export markets. Although it is thought that a reduction in prices might induce more buying, mills decline to grant any further concessions. There is continued discussion of central selling as a remedy for the small volume of export trade, but makers seem to be unable to agree on such a plan.

INDIA BUYS MACHINERY

United States Proportion Growing Slowly, But Great Britain Dominates Market

Imports of industrial machinery into India, excluding railroad locomotives, electrical equipment, agricultural machinery, sewing and knitting machinery and typewriters, during the fiscal year ended with March, 1927, amounted to $36,656,146, of which $3,325,616, or 9.06 per cent, represented shipments from the United States and Canada, according to a statement prepared by R. G. Matthews of the Department of Commerce, Washington. It is estimated that less than one-third of 1 per cent of the latter amount came from Canada, while the portion from that country for the fiscal year 1925-1926 was less than one-half of 1 per cent. The value of imports from the United States and Canada in 1925-1926 was $3,651,164, or 8.63 per cent of the total value of $42,316,438.

Imports from the United Kingdom during 1926-1927 were valued at $29,106,588, or 79.44 per cent of the total, against $34,136,025, or 80.67 per cent, for the preceding year. Imports from Germany and Austria were valued at $2,551,252, or 6.95 per cent, in 1926-1927, against $2,420,183, or 5.72 per cent, during the preceding year.

In the classification of "prime movers," including oil engines, steam engines, gas engines and other forms of engines, exclusive of locomotives and their parts, the United State increased its total volume of business approximately $47,138 in 1926-1927 as compared with the preceding year. This came about through increases in the amount of steam engines and parts purchased, and in gas engines and parts. The United Kingdom lost about $362,000 in shipments of oil engines and parts to India, while Germany's gain was insignificant.

There was a decrease of $979,020 in imports of mining machinery, American shipments declining $507,640 and British shipments by practically the same amount. German equipment more than doubled, gaining approximately $271,770. Imports of refrigerating machinery made a gain of about $126,910, the United Kingdom more than doubling its contributions, which were increased $101,528, but American shipments increased only $616. Germany showed a slight gain.

The United States was able to increase its entry of metal-working machinery by $6,526, while the United Kingdom's amount dropped almost $181,300 and that from Germany decreased about $45,325. Imports of sawmill and wood-working machinery from the United States more than doubled, increasing by $29,153. The United Kingdom received practically five times as much business as the United States, but showed a decrease of $25,382, while German shipments dropped $18,855. Miscellaneous industrial machinery showed the greatest increase of imports from the United States—in all, approximately $249,468, while the United Kingdom had an increase of $38,073 and Germany, $67,071. This classification includes construction machinery, dredging machinery, excavators, etc.

DUTY ON SMALL SHAPES RAISED

Bar-Size Angles, Channels and Tees Reclassified as Subject to Bar Instead of Structural Rate

NEW YORK, June 19.—A decision of the United States Treasury Department, approved June 2, classifies bar-size angles, channels and tees under paragraph 304 of the tariff act, which covers bars, instead of under paragraph 312, relating to structural material. As a result, the duty is advanced from the former rate of 20c. per 100 lb. to the bar duty of 30c. per 100 lb.

It appears as the result of an investigation, says the decision, that angles, channels and tees in sizes less than 3-in. are distinguished in the trade from the larger sizes of the said articles and that the smaller sizes are known as angle bars or angles, bar size; as channel bars or channels, bar size; and as tee bars or tees, bar size. The decision, which is in the form of a letter to the Collector of Customs, continues: "The appraiser further states that the smaller sizes referred to are produced on a bar mill and are chiefly used as metal lath to support plastering and in other finishing and fireproof work and are in no way associated with structural sizes or employed in structural uses.

"In forwarding the letter from the appraiser you state that there were submitted, from several domestic firms, letters which support the view that steel angles, channels and tees in sizes less than 3 in. are bought and sold on a bar basis and not on the basis of structural shapes, and that an inspection of the price lists of the firms referred to shows a distinction is made therein between angles, channels and tees, structural, and angles, channels, and tees, bar sizes.

"In view of the appraiser's report and a perusal of the price lists submitted, the department is of the opinion that the articles under consideration, when in sizes less than 3 in., are not known as structural shapes as that term is used commercially, and in view of the well established principle that the commercial designation of an article ordinarily governs its tariff classification the department concurs in the opinion expressed by you that all of the articles enumerated, when less than 3 in. in size, are excluded from classification under paragraph 312 and are properly dutiable under paragraph 304 of the said act. However, as the rate of duty under paragraph 304 is higher than that under paragraph 312, the higher rate should not be imposed except upon merchandise entered for consumption or withdrawn from warehouse for consumption after 30 days after the date when this letter appears in the weekly Treasury Decisions."

While the decision makes no reference to the decision on reinforcing bars rendered early in February by Justice I. F. Fischer of the United States Customs Court, Second Division, it is perhaps noteworthy that in both cases the intended use of the materials in question is stressed. Justice Fischer said: "We are of the opinion that within all the prevailing decisions on the subject these deformed bars are structural shapes, since that is their chief, if not exclusive, use. Certain it is that they are *ejusdem generis* with the beams, girders, joists, angles, channels and other structural shapes enumerated in paragraph 312. We therefore sustain the claim alleged in the protest under the latter paragraph and reverse the decision of the collector in each instance as to this merchandise."

The decision on deformed steel bars, which classifies them as construction material under paragraph 312 with a duty of 0.2c. per lb., instead of paragraph 304

IMPORTS OF INDUSTRIAL MACHINERY INTO INDIA FROM THE PRINCIPAL SUPPLYING COUNTRIES

Country of Origin	1924-25 Per Cent of Total	1924-25 Value of Imports *	1925-26 Per Cent of Total	1925-26 Value of Imports *	1926-27 Per Cent of Total	1926-27 Value of Imports *
United States and Canada	8	$3,131,932	8.63	$3,651,164	9.06	$3,325,616
United Kingdom	84	32,885,283	80.67	34,136,025	79.44	29,106,588
Germany and Austria	4	1,565,966	5.72	2,420,183	6.95	2,551,252
Japan	0.5	195,746	0.24	102,617	0.18	68,240
Other countries	3.5	1,370,220	4.74	2,006,449	4.37	1,604,450
	100	$39,149,147	100	$42,316,438	100	$36,656,146

*American dollars.

with a duty of 0.3c. per lb., has been appealed by the Government and is expected to come before the Customs Court of Appeals on the fall calendar.

Importers of European steel may appeal from the decision of the Treasury Department on bar-sized angles, channels and tees, but no definite action has been taken as yet. In the first four months of this year a total of 58,395 gross tons of structural shapes and building forms were imported into the United States, with a value of $1,812,050. As the statistics of the Department of Commerce do not classify the smaller, bar-size shapes, separately, there is no method of determining how much of this total consisted of material that will be affected by the Treasury Department decision increasing the duty.

Poldi Steel Works Not Member of Steel Cartel

A report received by the Department of Commerce, which was published in THE IRON AGE, May 3, stated that the Skoda Steel Works and Poldi Steel Works had refused to pay a share of the International Steel Cartel fine on Czechoslovakian works for overproduction.

According to the Poldi Steel Corporation of America, 245 West Eighteenth Street, New York, this report was in error, as the Poldi Steel Works is not and never was a member of the steel cartel. Consequently, it is pointed out, the Poldi Steel Works was not bound to make any payments and, in fact, no overproduction fines whatever were assessed against it.

"The report," says the Poldi Steel Corporation, "is due to an error caused by the fact that, on the occasion of the allotments being assigned, the Czechoslovakian Iron Works arranged for the production of the Poldi Steel Works to be included in the Czechoslovakian steel production. The Czechoslovakian Iron Works did so upon its own risk and actually took charge of all obligations and payments resulting from this action.

"Some time ago the Czechoslovakian Iron Works requested the Steel Cartel to agree to the production of the Poldi Steel Works being exempt from the amount on the basis of which the quota was assigned. The Poldi Steel Works, however, had nothing to do with this matter."

To Concentrate Manufacturing at Two Plants in Place of Seven

Established by Oliver Ames in 1774, the Ames Shovel & Tool Co. for 154 years has been a leader in the shovel industry of the United States. Its present plant in North Easton, Mass., was built for the most part between 1850 and 1875. Its building and machinery cannot, in any sense, be considered modern. The company has for several years been making a comprehensive survey to determine the necessary steps to modernize the business.

At present the company has seven plants—four blade factories and three handle factories—located in North Easton, Mass., Cheltenham, Pa., St. Louis, Anderson, Ind., Cumberland, Me., New Albany, Ind., and Paris, Tex. After careful analysis the executives concluded to concentrate manufacturing at two points—the Eastern plant at North Easton, Mass., and one Western plant. This means that a complete new shovel plant will be built at North Easton and, by concentration of production at that point, output will be greatly increased.

No change in the policies of the company will be made and it is hoped that the quality of the Ames shovel can be improved by the new facilities. It is an interesting fact, in passing, that Ames shovels have been carried by soldiers of the Revolutionary War, the Civil War and the World War and have played a major rôle in the building of American railroads.

In connection with the expansion program at North Easton, new lines of manufacture, as feasible, will be added to shovel manufacturing. The company has as associates in building the new plant certain executives of Stone & Webster, Inc. The headquarters is being moved from Boston to North Easton, and all Eastern executives of the company will take up residence at North Easton.

EXPORT BUSINESS SMALL

Higher European Prices Help American Mills—Duty on Furring Channels Increased

NEW YORK, June 19.—A moderate volume of export business continues to be done with South America, which has been a rather consistent buyer of European material until recently, when Continental prices began to advance. The orders are small and generally for prompt shipment, mainly covering galvanized sheets, wire and wire products.

Exports to China show no improvement as yet and business with Japan is still limited. The Tokio subways have been inquiring for 370 tons of 100-lb. rails, Pennsylvania sections, and 160 tons of 90-lb. rails, A. R. A. Type E, with accessories, and about 50 tons of tie plates. Bids opened June 15.

New York importers of European steel report continued inactivity, with foreign prices at a high level. There have been no further advances by Continental mills, and on some small sizes they are evidently willing to accept orders for fairly early delivery. Plain steel bars cost importers about 1.79c. per lb., duty paid, New York, and sales are reported to have been made to consumers in the metropolitan district at 1.92c. per lb., ex-dock. Structural shapes cost importers about 1.70c. per lb., duty paid, and sell at 1.80c. to 1.85c. per lb. from the dock.

The recent decision of the Treasury Department classifying bar-size channels, angles and tees under the bar paragraph of the tariff act, instead of as structural material, will increase the cost to importers by $2 a ton. While imports in recent weeks have not been large, for a number of months there has been a fairly active business in furring channels from Continental mills and the new rate of duty may considerably curtail this trade, unless importers are able to absorb the increased duty and still have a profit.

Researches for British Navy Rapidly Expanding

Governmental research in Great Britain has had a marked growth over pre-war years. *Engineering*, June 8, analyzes appropriations for naval research which indicate this growth clearly. A bill providing for "scientific services" for the coming year includes scientific research, and appropriates £503,894, compared with £99,648 in 1914-15. Personnel is now 1207, compared with 128. In the former year the bulk of the money went for the Greenwich and Cape of Good Hope observatories, for the nautical almanac and for chronometers for the navy. The following important items have no counterpart in pre-war appropriations:

Experiments on ship propulsion	16 persons	£4,728
Staff subject to special assignments	177 persons	£89,057
Researches at National Physical Laboratory	75 persons	£14,941
Oil engine research	57 persons	£14,385
Electrical machinery research	27 persons	£6,709
Chemical warfare in the navy	58 persons	£16,131
Cordite investigation	8 persons	£4,187
Grants to other laboratories		£126,752
Mines and anti-submarine investigations	197 persons	£34,141
Wireless and signalling	179 persons	£29,883

The numbers include naval officers whose pay is carried in other accounts. Other appropriation bills have carried amounts for specific investigation as follows:

Armor and gun mounts	£79,000
Torpedoes, mines and explosives	£142,000
Extensions to laboratory equipment	£47,000

Excluding certain routine activities, and including money from other sources, our British contemporary estimates that during the next year at least 1000 persons will be engaged strictly in research work for the British navy, and will expend more than £625,000. Similar work in 1914 came to no more than £20,000. The sum was then about 1 per cent of the money spent on new ships; it now amounts to about 7 per cent, and is equivalent to the cost of two destroyers or submarines.

Little Change Shown in Productive Activity

Measurement of productive activity, based upon consumption of electric energy in about 3000 manufacturing plants, as collected by *Electrical World*, shows in May a fractional decline from April. With the index of 100 representing the average monthly activity of 1923-1925, the May index is 119 against 119.3 for April. For the first five months of the year the average index has been 120.5, against 117.3 for the first five months last year.

Taking the metal industries as a whole, May showed a slight gain over April, standing at 123.6 against 123.2 a month earlier, and comparing with 116.7 in May, 1927. For the first five months the metal industries index was 124.6 against 117.3 a year ago. The rolling mill and steel plant group, included within the metal industry, showed 125 for May against 125.4 for April. In the first five months it was 128 against 123.8 a year ago. Metal-working plants, both ferrous and nonferrous, and excluding the rolling mill and steel plant group, made a gain in May, showing 122.7 against 121.7 in April, and both comparing with 109 in May, 1927. For the first five months the record was 121.4 against 110.4 a year ago.

Gain in British Iron and Steel Output in May

LONDON, ENGLAND, June 18 (*By Cable*).—Production of pig iron in May was 591,500 gross tons, and that of steel, including castings, was 752,700 tons.

A comparison of the May output with that of the four months of the year and with the monthly rate for previous years is as follows, in gross tons:

	Pig Iron, Tons	Steel Ingots and Castings, Tons
1913—Average monthly.....	855,000	638,600
1920—Average monthly.....	669,500	755,600
1922—Average monthly.....	408,500	490,100
1923—Average monthly.....	620,000	706,800
1924—Average monthly.....	609,900	685,100
1925—Average monthly.....	519,700	616,400
1926—Average monthly.....	203,500	296,700
1927—Average monthly.....	607,800	758,200
1928—January	560,600	626,200
1928—February	550,800	764,400
1928—March	592,600	793,300
1928—April	555,000	644,100
1928—May	591,500	752,700

Portland Cement Production in 1927

Production of Portland cement in 1927 is given by the United States Department of Commerce at 173,206,513 bbl., the largest total in the history of the industry. It represents a growth of more than 5 per cent above the previous record of 164,530,170 bbl., made in 1926. Shipments were slightly below production in both years, the value of shipments in 1927 having been $278,854,647, at an average factory price of $1.62 a barrel, compared with $1.71 in 1926. Stocks on hand at the end of the year increased from 20,740,187 to 22,081,922 bbl. These are the final annual figures for the industry.

Increase in Mechanical Stokers Sold

Mechanical stokers sold in May numbered 130, of 38,705 hp., according to the Department of Commerce. This is a substantial gain over the 88 units of 31,043 hp. in April, but is otherwise the smallest since January. It compares with 97 units and 43,601 hp. in May, 1927, and with 129 units and 48,482 hp. in May, 1926. Total for the first five months aggregate 183,388 hp., compared with 201,411 hp. last year.

Shipments of enameled sanitary ware in April showed a seasonal increase, according to figures of the Department of Commerce. The total number of pieces shipped aggregated 407,705, compared with 381,395 in March and with 374,614 a year ago. Shipments of bath tubs were 105,718 in April, this being the largest number since last August.

Farm Machinery Production Remains High

Total production of farm equipment in the United States in 1927 was valued at $459,574,443, compared with $461,399,528 in 1926 and $391,812,436 in 1925, according to data collected by the Bureau of Census at the annual canvass of manufacturers. Tractors furnished more than 34 per cent of the total in 1927, with harvesting machinery, far lower, in second place at 12 per cent. Machines for preparing harvested crops, plows and listers, and planting and fertilizing machinery followed, in that order, each with between 5 and 8 per cent of the total.

British Exports Gain and Imports Decline

WASHINGTON, June 19.—Exports of iron and steel products from the United Kingdom in May totaled 359,017 gross tons, compared with 344,333 tons in April, an increase of 14,684 tons, or 4.1 per cent, while imports amounted to 236,852 tons, compared with 252,677 tons, a decrease of 15,825 tons, or 6.3 per cent, according to cablegrams received by the Department of Commerce from London.

The May export movement was the greatest of the current year except in March, when outgoing shipments aggregated 409,297 tons. Of the 22 classes, however, only 10 reflected gains in May compared with April. The principal increases were in pig iron, which gained 13,273 tons, mounting to 45,084 tons; tin plate, which increased by 9123 tons to 47,358 tons; plates and sheets, gaining 7715 tons to a total of 47,431 tons; wrought tubes, increasing by 6291 tons to 24,923 tons, and cast tubes, increasing by 3981 tons to 12,097 tons. Exports of rails declined sharply, falling 21,892 tons to a total of 22,206 tons.

The reduction in imports was confined to only seven of the 19 classes, the remaining 12 showing gains. The sharpest drop was in steel ingots and in semi-finished steel, which declined 24,361 tons to 95,590 tons.

The generally improved tone of export trade was reflected in the production of pig iron and steel. Blast furnace production of iron in May totaled 590,500 tons, compared with 555,000 tons in April and the monthly maximum of 592,000 tons in March. Ingot production was 752,700 tons, compared with 644,100 tons in April. At the end of May there was one less furnace in blast than in April, the total being 148. There was an increase of two open-hearth furnaces in operation, bringing the total to 261.

Wholesale Prices Advance Again

Wholesale prices in May, as reported by the United States Bureau of Labor Statistics, showed a substantial advance over April, standing at 98.6 per cent of the 1926 average, compared with 97.4 in the earlier month. Both were considerably above the 93.7 reported for May, 1927. The increases were participated in by most of the major subdivisions of the 550 prices comprised within the index. Some of these increases, however, were fractional. The largest was that in farm products, which advanced from 107.6 in April to 109.8 in May. Metals and metal products went up from 98.4 to 98.6, iron and steel showing a fractional decline, while non-ferrous metals and automobiles advanced slightly.

Finished products showed an advance from 95.9 to 97.1, compared with a gain from 97.9 to 98.6 for semi-manufactured articles and one of 100.1 to 101.4 for raw materials. The advance for non-agricultural commodities was from 94.7 in April to 95.6 in May. All of the groups mentioned in this paragraph were considerably higher in May, 1928, than they were a year earlier.

Total apparent consumption of babbitt metal in May, based on reports received by the Department of Commerce from 31 firms, was 4,606,899 lb., compared with 4,842,656 lb. in April and 4,945,705 lb. in May, 1927.

Organize to Secure Delegates to Engineering Congress in Tokio

A movement to marshal a large delegation of engineers from the United States to attend the first World Congress of Engineers to be held in Tokio, in October, 1929, has been organized under the chairmanship of George W. Fuller, 170 Broadway, New York. Elmer A. Sperry, Manhattan Bridge Plaza, Brooklyn, will lead the American delegation; Herbert Hoover is honorary chairman of the committee.

A special committee will organize local cooperative committees throughout the United States (which would include the local sections of the national engineering societies as well as independent engineering clubs and societies) to inform engineers generally of the aims and objectives of the World Congress.

Engineering colleges plan to raise by subscription among the alumni a testimonial fund to send members of their faculties whom the alumni would wish to honor for notable services to their institutions.

Baron K. Furuichi is president of the congress; the permanent address is Nihon Kogyo Club, Tokio, Japan. According to preliminary announcements from Japan, sectional meetings will be organized to cover all branches of engineering, applied science and engineering administration, and technical papers and topical discussions will be heard. Papers will be in either English or Japanese, limited to 8000 words, and must be submitted before April 1, 1929. General meetings will also be held, as well as an attractive group of social gatherings and excursions throughout Japan and Manchuria.

Detailed information may be had from Maurice Holland, 29 West Thirty-ninth Street, New York.

Conference on Human Relations in Industry

The eleventh annual conference on human relations in industry will be held at Silver Bay on Lake George, N. Y., Aug. 29 to Sept. 2, under the auspices of the industrial department of the National Council of the Young Men's Christian Associations. Among the speakers will be Howard Coonley, president Walworth Co., Boston; Bryce Stewart, Industrial Relations Counselors, Inc., New York; Prof. Michael Pupin, Columbia University, New York, and C. J. Hicks, assistant to president Standard Oil Co. of New Jersey, New York.

Edward D. Dee, Western Electric Co., New York, will be chairman of a sectional conference at which the topic for discussion will be "The Foreman as a Personnel Developer." Frank Whiting, general claims attorney New York Central Railroad, will lead a conference on "Pensions and Retirement Plans," and J. W. Dietz, Western Electric Co., Kearny, N. J., will preside over sessions on "Personal Service to Operating Departments." Other sessions will be devoted to "Economic Incentives," "The Scientific Approach to Industrial Relations" and "Personal Problems and Work Efficiency."

Arthur H. Young, Industrial Relations Counselors, Inc., New York, is chairman of the committee in charge of the Silver Bay conference.

Blast Furnace and Coke Oven Association Elects Officers

Continuing the policy of rotation in office, B. W. Winship, superintendent of coke works Bethlehem Steel Co., Steelton, Pa., who has been vice-president Eastern States Blast Furnace and Coke Oven Association, was elected president of the association at the annual meeting held at the Edgewood Country Club, Edgewood, Pa., June 12. W. A. Haven, superintendent northern furnace Republic Iron & Steel Co., Youngstown, Ohio, who has served the past year as secretary-treasurer, was elevated to the vice-presidency, and James E. Lose, assistant general superintendent Homestead works Carnegie Steel Co., was elected secretary-treasurer.

This meeting brought together approximately 150 men interested in the operation of blast furnaces and coke plants in the eastern half of the country. B. F. Fairless, president and general manager Central Alloy Steel Corporation, who was to have been the principal speaker following the banquet, was unable to be present, and in his stead Edward A. Portz, general superintendent of that corporation, made a plea for cooperation on the part of the coke oven and blast furnace men with the steel producers in the solution of the ever-growing problem of manufacturing steel of a quality which would meet the exacting demands now imposed by almost all consumers.

Mr. Portz's subject was "Importance of Coke and Pig Iron in the Production of Quality Steel." He stressed the importance of proper testing of coke as prerequisite in making good pig iron, stating that coke is the most important single factor in the production of iron. Uniformity in pig iron quality calls for uniformity in blast furnace operation, he said, and proper grading and testing of coke would be a big help in attaining that end.

John W. Hacker, superintendent of coke works Central Alloy Steel Corporation, chairman of the coke committee of the association, in his report suggested that members study and report on the relation between coke in the tumblers and in the furnace. He referred to a recent article in *Stahl und Eisen*, in which the author described a test in which the pressure in the furnace is duplicated. F. W. Sperr, Jr., Koppers Co., Pittsburgh, chairman of the committee on phenol determination and disposal, reviewed briefly the work of that committee and indicated that a printed report would be available for members later.

Mechanical Engineers to Hold Aeronautical Meeting

The American Society of Mechanical Engineers will hold its annual aeronautical session concurrently with the Air Olympics at Detroit next week. From 500 to 1000 aeronautical engineers are expected to attend. The convention opens June 28 and closes with the Air Olympics "field day" at Ford Airport on June 30. In addition to six technical sessions, at which papers will be read on transport, power plant, design, airways and airships, there will be a joint session with boy builders of airplane models, at which Prof. A. Klemin of New York University will demonstrate a 20,000-photographs-a-second motion picture film of the Japanese Aeronautical Institute.

Five major aeronautical events will feature the Air Olympics at Ford Airport, June 30. The National Air Tour, in which more than 25 ships will compete for the Edsel B. Ford trophy, will start from the airport at 10 a.m. in a 6000-mile reliability contest in which at least 30 cities will be visited, including San Antonio, Tex., Los Angeles, Cal., and Seattle, Wash. In the afternoon the seventeenth Gordon Bennett International Balloon Race, in which eight countries will be represented, will start from the same field.

Some 500 boys from all parts of the country are expected to attend the Air Olympics to exhibit their model airplanes in the Boys' Model Airplane Contest at the airport, sponsored by the Airplane Model League, an organization in which 150,000 boys are enrolled. Another feature of the Air Olympics program will be an exhibition of glider flying by the German champion glider team now in this country.

Second Canadian Steel and Power Show

Canada's second Steel and Power Show will be held at the University of Toronto Arena, Toronto, Ont., Sept. 4 to 7. Campbell Bradshaw, 24 Front Street, West, Toronto, is executive director of the exhibition.

Establishment of the Holland Institute of Thermology, to conduct researches into various phases of the relation of humidity, temperature and circulation of air to public welfare has been announced by A. H. Landwehr, president of the Holland Furnace Co., Holland, Mich. It will attempt to solve some of the heating and ventilating problems of the construction industry, study the effect of humidity upon various industrial products used in homes, and investigate problems connected with industrial housing and the efficiency and working conditions of workers in shops and offices.

TO LINK PLANES AND SHIPS

Combined Service at High Speed Insures Development of Our Merchant Marine

IT is inevitable that ships of the air and ships of the sea will work together. The Jones-White bill which President Coolidge signed recently makes it possible for American shipbuilders and operators to develop profitably American shipping which will coordinate air and ocean traffic. So writes Laurence R. Wilder, general manager of the Transoceanic Corporation of the United States, in the *American Mutual Magazine*, published by the American Mutual Liability Insurance Co., Boston.

Ships of new and distinctly American type, he states, will result from the enactment of the Jones-White law. The very fact that we have not built a single ship for foreign service in America in the past seven years, and that we have built only two important deep-water ships for coastwise service, becomes suddenly and unexpectedly an advantage. Our foreign competitors are committed by 8,000,000 tons of shipping to the present type of ship. We are not committed at all in any way.

For more than 15 years airplanes have been recognized as reliable, Mr. Wilder said, but ships have not yet been designed, for commercial service, to include aircraft in their operation. But the country which built the giant navy airplane carrier Saratoga will build commercial Saratogas to carry passengers, mail and express freight across the North Atlantic, and to accommodate airplanes. As on the Saratoga, the masts and funnels and the bridge of these new ships will be set to one side; the whole top deck will be clear to receive and send off airplanes.

By use of airplanes, today's mail will catch yesterday's ship out at sea, and tomorrow's mail, by flying ahead of the ship, will be delivered today.

Not only in the type of ship have the foreign nations been lagging. They have been offering bigger and more luxurious vessels, but they have not been increasing speed. The Mauretania, 21 years old, is still the fastest. Three-quarters of all those who travel across the North Atlantic are Americans. If they are given faster ships with greater comfort, they will ride on these ships. The Transoceanic Corporation is formed to supply that need. Its ships have been designed to maintain a speed of 33 knots at sea. Similar speeds have been attained by naval craft and the corporation proposes to do for peaceful commerce only what has already been done in preparation for war.

Bar Iron Wage Scale to Be Based on a 1.90c. Minimum Price

The agreement reached in the bar iron wage scale conference in Atlantic City, mentioned in THE IRON AGE of June 14, calls for a continuance of the 1927-28 rates for another year, but with the understanding that the minimum base will be on a 1.90c. card rate. As the last bi-monthly examination of sales records disclosed an average price of 1.85c. per lb. for bar iron, puddlers have been getting $11.05 per gross ton for boiling. They now are assured of $11.30, even if the next examination of the sales records does not show an increase in the average sales price. There is a corresponding adjustment in the wages of other men employed in bar iron plants.

One Means to Enhance Profits

In the June 15 issue of the "Monthly News Bulletin" of the commercial standards group of the Department of Commerce appeared the following case for adoption of standards in manufacturing:

"A well-known manufacturer of parts supplied a score or more of automobile companies. Each one bought from 10,000 to 500,000 parts a year, but each wanted some minor variation in the pattern. The constant change in machine set-up necessitated by these varying demands kept the parts manufacturer's plant in confusion. He was practically operating on a job-shop basis, although his total output was large enough to warrant quantity production economies.

"Careful figuring showed him that he could cut his price in half, improve his delivery service and yet make more money himself, if he could induce all his customers to accept the same pattern. He laid the facts before them. They accepted the proposal. One of them saved $4,000,000 a year, or $20 a part on 200,000 parts. This is what simplification means when business cuts off some of its unessential frills."

The transportation division, Department of Commerce, Washington, has undertaken a survey to ascertain the amount and kind of cargo available in every city and town along the Ohio and Mississippi Rivers between Pittsburgh and New Orleans. Similar surveys were recently completed by the transportation along the Mississippi, Warrior and Missouri Rivers. The present investigation is being made to determine the advisability of establishing contract barge transportation service along the route mentioned, catering to companies able to offer cargoes in 125, 250 and 500-ton lots.

To Conduct Course for Plant Conference Leaders

ROCHESTER, June 16.—Under arrangements made by the Industrial Management Council of the Chamber of Commerce, a course of instruction for plant conference leaders will be conducted for two weeks beginning June 18 in the Chamber building by A. L. Mann, supervisor of industrial education for the State Department of Education and formerly of the Eastman Kodak Co. of this city.

The course will include discussion of the various methods of foreman training and related subjects. Similar courses have been conducted by Mr. Mann in other cities.

Testing Stainless Steel on Ships

In order to test the action of sea water and sea air on steel, a plate made of a special stainless steel has been placed on the promenade deck of the Blue Star Liner Arandora, which recently left London for Buenos Aires. During the Arandora's 13,000-mile journey to South America and back the plate will not be cleaned or touched in any way. A day-by-day observance will be kept, and it is hoped to obtain valuable data on the use of stainless steel for ships' fittings.

Civil Service Examinations

The United States Civil Service Commission announces the following open competitive examinations: Chief engineering draftsman (ship), entrance salary, $2,600 a year; principal engineering draftsman (ship), $2,300; senior engineering draftsman (ship), $2,000; engineering draftsman (ship), $1,800. Applications must be on file with the Civil Service Commission, Washington, not later than July 18. The examinations are to fill vacancies in the Coast Guard, Treasury Department, Washington, and in positions requiring similar qualifications. Full information may be obobtained from the Civil Service Commission, Washington, or the secretary of the civil service board of examiners at any post office or custom house.

Simplified practice Recommendation No. 57, for wrought iron and wrought steel pipe, has been reaffirmed, without change, for the year beginning June 1, according to the division of simplified practice of the Department of Commerce. A survey conducted prior to the revision conference indicated that the average degree of adherence to the recommendation was 95 per cent. This recommendation reduced the variety in sizes of valves and pipe fittings from over 20,000 to 19,238, and sizes of pipe from 62 to 49.

STEEL REINFORCING BARS

Standard Adopted Last Year Now Withdrawn, Due to Lack of Support

WASHINGTON, June 19.—Through George K. Burgess, director, the Bureau of Standards has formally announced withdrawal of its pamphlet entitled "Commercial Standard No. 1, New Billet Steel Concrete Reinforcement Bars." Doing away with this simplified practice recommendation, which adopted as standard the intermediate grade of new billet steel concrete reinforcement bars according to specifications of the American Society for Testing Materials, was attributed to lack of support from producers.

Conferences on the subject were called originally at the request of the Truscon Steel Co., made to the National Committee on Metals Utilization under date of Oct. 8, 1925. Strong support was given to the movement by distributers and their association, known as the Concrete Reinforcing Steel Institute, highway engineers, architects and others representing consumer interest. Following a survey of current practice and two general conferences held Jan. 26, 1926, and March 19, 1927, the program adopting the intermediate grade as the standard, and eliminating the hard and structural grades, was determined upon.

On Dec. 21, 1927, however, one of the largest producers withdrew its acceptance. An intensive campaign for obtaining producer acceptances was instigated by the Concrete Reinforcing Steel Institute, resulting in final action of the Association of American Steel Manufacturers which, at a meeting, went on record as neither approving nor disapproving the recommendation. The meeting held that the use of a particular grade of concrete reinforcement bars for various types of construction involves questions of engineering, safety and economy, which necessarily must be decided by the designing engineers or the users.

Since the procedure for the establishment of commercial standards requires written acceptances representing 65 per cent of producers by volume, and ample support from distributers and consumers, and because it is difficult to estimate accurately the percentage of consumption represented by distributer and consumer acceptances, the bureau considered that it was not desirable to modify the rules of procedure, or to continue its support for the project, without the definite approval of the producers. Doctor Burgess explained that the program is still actively supported by the Concrete Reinforcing Steel Institute, as well as many architects and highway engineers, and that, in the event the demand for the intermediate grade continues to grow and producers are disposed to lend their formal approval, the bureau will then cooperate and support the program upon request by the issuance of the pamphlet.

Withdrawal of the recommendation concerning the grade, however, in no way affects the recommendation, in effect, which reduced the sizes of reinforcing bars from 44 to 11. This reduction in sizes, according to O. W. Irwin, manager of reinforcing steel sales, Truscon Steel Co., Youngstown, Ohio, in a letter to Secretary of Commerce Hoover under date of April 24, 1925, means a saving in capital investment of about $4,500,000 for the industry.

Steel Must Advertise

Under the caption "Steel Must Advertise," *Printers' Ink* in its issue of June 7 commented on editorials in THE IRON AGE of April 19 and May 24, in part as follows:

"Premier Baldwin, speaking in London recently, said, 'It does look as though business and industry are groping toward a position in which businesses making the same kinds of goods will have to combine, at least for the purpose of pushing and advertising those goods and bringing new orders home. They are trying to do it in the coal trade. They will doubtless have a try at it in the steel trade.'

"THE IRON AGE, to which we are indebted for the quotation, recently published an editorial pointing out the need for consistent, logical advertising on the part of the steel industry. In this editorial was the following passage:

> Certain sections of the steel industry have attempted recently to place their products in a favorable light in the public prints. But the statement holds true that the industry generally—and its various units large and small—is the loser because for thirteen years it has postponed the use of well-considered publicity; such publicity as on the one hand would reach the ordinary citizen and tell him about steel and on the other hand would show the manufacturing consumer of steel why he would do well to use more of it.

"*Printers' Ink* has long maintained that the basic industries have as much or more reason and necessity for advertising as the so-called converting industries. The present century has seen great changes in the markets for basic commodities with the consequent shifting of volume from one industry to another. Only the fact that the country's capacity to consume has grown by leaps and bounds has made this shifting less noticeable and less pinching to certain industries than would have been the case if consumption had increased less rapidly of its own accord.

"Today the steel industry is faced by competition from the producers of copper and substitute products and only the fact that manufacturers outside of the industry have constantly been discovering new uses for steel has made it possible for the steel manufacturers to continue on their way blind to their lost opportunities.

"It is encouraging to note that leaders in the steel industry both at home and abroad are realizing the necessity for some kind of cooperative effort to increase the sale of steel. It is even more encouraging to *Printers' Ink* to note that they almost automatically consider advertising one of the means to increased sales."

Unusual Employment Guarantee

A steadily increasing program of employment at the plant of the Canadian Steel Corporation, Ojibway, Ont., for the next 10 years has been revealed in negotiations between the corporation and a special committee of the County Council, negotiating on the question of fixed assessment for the steel plant. Under tentative arrangements drawn up for assessment of the property upon which the steel plant stands, the corporation agrees that a minimum of 500 men shall be employed at the plant by the end of 1931. At the conclusion of the ensuing three years a minimum of 800 is guaranteed and for the following four years employment is guaranteed for 1000 men.

These guarantees are of particular significance, apart from the figures quoted, as displaying the intention of the steel company to increase its activities at Ojibway. At present slightly less than 200 men are employed at the plant. Details of the fixed assessment have not yet been worked out by the county committee. Warden A. A. Marentette stated, however, that it is probable an agreement would be reached which would be satisfactory to the county and to the steel company.

Great Increase of River Shipments

PITTSBURGH, June 19.—Shipments of iron and steel products from the Pittsburgh district plants on the Ohio River, which are a gage of the efforts of manufacturers to escape the high railroad freight rates and the incident localization of distribution, keep on mounting.

In May, the movement amounted to 112,818 net tons, the United States Engineers' Corps, Pittsburgh office, reports. This is a new high record mark and compares with 110,356 tons in April and 50,130 tons in May last year.

In the five months ended May 31, Ohio River shipments have amounted to 458,504 tons, compared with 181,516 tons in the same period last year.

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This Issue in Brief

Welding will supersede many old forms of assembly, engineer says. Instead of building up units and bolting them together, they will be designed for union by flash welding, he believes.—Page 1743.

Endurance limit of rail steel is increased if the rail is subjected to reversals of stress at a value below its endurance limit. If the reversals of stress are *above* the endurance limit, the rail will fail in fatigue at a stress considerably below its true endurance limit.—Page 1744.

Pig iron prices' downward trend may be due to less pig iron being used in proportion to steel made, says Doctor Haney. Evidently a broad change in the industry is reflected, as the annual rate of increase in pig iron production has become smaller. —Page 1759.

Forms poppet valves from a single piece of steel by upsetting process. Valve heads are then reheated and formed in a coining press.—Page 1754.

Wholesale prices continue to rise. May index figure covering 550 commodities was 98.6, as compared with 97.4 in April, and 93.7 in May, 1927. (Note: 1926 average equals 100.). —Page 1764.

Profits are increased by accident prevention work. Safety campaigns more than pay for themselves on a purely pecuniary basis, and, in addition, they keep down labor turnover and increase productivity of employees.—Page 1745.

Cuts assembly costs by flash welding. Automobile manufacturer secures a clean, strong joint, at low cost, for parts which, under use, must maintain their physical integrity. Tests reveal that fractures occur, not at the joint, but elsewhere in the part.—Page 1739.

Boiler plate will withstand a stress of 12,500 lb. per sq. in., at 500 deg. Fahr., without permanent deformation. But at 800 deg. the stress must not exceed 10,000 lb. per sq. in., if the boiler is to remain in service indefinitely.—Page 1749.

Doubles production by using new type of resistance welder. Labor cost in assembling differential neck and ring is cut 67 per cent by automatic welder designed and built by Ford. Air-operated clamps hold the pieces; current is turned on and off, pressure is applied and released, and clamps are separated, all automatically.—Page 1742.

Phenomenon of hotter iron and higher combined carbon is explained by Doctor Moldenke. The disappearance of graphite nuclei under conditions of extremely hot melting helps to retard the formation of large graphite crystals.—Page 1747.

New high record in steel ingot output for first half-year reveals that trade is not dull. Previous record will be passed by about 3 per cent. To equal 1927 output a producing rate of only 67 per cent will be required for the remainder of the year.—Page 1770.

Cast iron can recapture lost markets, says Doctor Moldenke. "High-test" iron (2.80 per cent total carbon), made from high steel scrap mixtures, can be produced in the ordinary cupola. —Page 1748.

Iron and steel prices are seriously out of adjustment, Doctor Haney declares. Finished steel, such as sheets and nails, and raw materials, such as coke and pig iron, are too low in comparison with billets and bars.—Page 1759.

Rail steel, killed with aluminum, can be poured free from pipe and excessive segregation, in sink-head molds of the Gathmann type. The distribution of carbon phosphorus, sulphur and silicon occurs in the same manner in such ingots as in sink-head ingots of other types. —Page 1743.

Best month on record, with one exception, for fabricated structural steel industry. May orders equalled 84 per cent of capacity, a sharp gain over April, and second only to July, 1927.—Page 1760.

Best way to control absenteeism is through good supervision, correspondent believes. The worker should be made to understand that punctuality and regular attendance are taken into consideration in raising salaries and making promotions.—Page 1772.

Almost one-third of railroads' total expenditures for materials and supplies is for iron and steel products. Class 1 roads bought $432,604,000 worth of goods from the metal-working industries in 1927.—Page 1750.

ESTABLISHED 1855

THE IRON AGE

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An Active Presidential Year

HALF of this year is virtually ended, and it has made a very fair showing, yet a little disposition is still seen to discuss whether or not presidential years are naturally "poor" years in trade. That the transaction of business might be impeded somewhat during the heat of the campaign is possible, but that is another matter, involving only a fraction of the calendar year. The tail end of the year, moreover, affords opportunity for recovery as to the calendar year totals. That is irrespective of the election outcome, for trade is in no danger from either candidate, and while as much cannot be said for some Congressional nominees, 1928 promises to be no healthier year for radicals than was 1924.

While a few days are lacking to complete half of the year by the calendar, more than half of a year's business is ordinarily transacted by this date. In the last three years the first-half steel ingot production has exceeded the second-half production by approximately 10 per cent, and this half-year is making a new first-half record by about 3 per cent. Portland cement shipments to June 1 made a new record by 1 per cent, though preceding years broke records by larger margins. Comparison of freight car loadings should exclude coal, as stocks were being accumulated early last year while this year stocks have been diminishing. Making that exclusion, other freight car loadings are off thus far this year by less than 1 per cent. Building contracts let in the year to date have made a new high record and the work involved must continue for months.

If political affairs should seriously injure trade, which is not to be expected, the results would be seen in the statistics of next year rather than this year. The year is half over and a large momentum exists, both as to the current pace and as to activity under contract. As to men being seriously minded during the relatively brief campaign, from the broader standpoint that should be to the advantage of trade in the long run. One cannot but feel that less interest is taken in governmental affairs than should be. Discussion should lead to enlightenment and that must conduce to progress in good government, which is to the advantage of trade.

As to the comparisons that are always being made between "now and a year ago," this year will henceforth be in luck, so to speak, for last year did not witness, in steel for instance, the revival in activity that usually comes after July. For the remainder of this year steel will have an easier pace to outdo. As a matter of statistical fact, it will require only a 67 per cent steel ingot producing rate, computed according to the accepted method, for the tonnage in the second half of this year to equal that for the second half of last year. Appearances that trade is dull must be carefully weighed, for the correct comparisons are likely to be favorable.

Brakes on in Stocks

LIQUIDATION and decline have come to the stock market, as the prophets foretold. When investment stocks had been bid up to prices on which their dividends figured only 5 per cent, while the interest rate on money was rising to 6 per cent, it was clear that stocks were being overpriced. When call money rose to 7 per cent the pools that were booming speculative issues and the public that was buying them like gambling chips both found that the handicap was becoming too heavy. Consequently readjustment was in order.

In the process a good many speculators have been converted into involuntary investors. They will have to wait patiently to see if in the course of time airships and radios and other new fancies will pay the dividends that would be the only justification for the prices lately quoted for the stocks.

The Federal Reserve Board discouraged the gambling that was becoming rampant. Probably this was unnecessary and probably it was uninfluential. The readjustment would have come anyway, as the economists had been forecasting for many months. Surely the amount of money that was being loaned on stock market collateral was no frightening factor or any sound reason for agrarian discontent. Call money does not deprive manu-

facturers, merchants and farmers of what they need, but is loaned on stocks owing to their not needing it, and is subject to instant return for their needs, no other form of loans being so liquid.

It is probable that after a good house-cleaning the stock market will again be bullish though more conservatively than in recent months, and that there will continue to be public participation. It is not discounting an economic depression, but is correcting itself. In such a process good stocks are bound to suffer along with the rest. Indeed it seems to be a curiosity of human nature that overextended speculators will sacrifice their good things in order to nurse their bad ones.

However, when a readjustment of this kind is completed it is the good securities that recover, while the bad ones do not. The true science of speculative investment is the discernment of conditions that are going to increase the earnings in certain industries and particularly of certain concerns engaged in them. Besides such discernment there must be imagination. Thus, the many persons who invested in the porphyry coppers 20 years ago and held them made great fortunes. Likewise did those who later went into automobiles and artificial silk. Without entering upon a long recital of such things, we may properly mention that those who early had faith in the United States Steel Corporation did well for themselves.

As our national economy progresses such opportunities recur more and more. The desire to take advantage of them is natural and praiseworthy. Even if this be overdone there is no widespread economic harm, if the enterprise itself be meritorious, although there may be individual misadventures and disasters. The deplorable speculation is when the surplus earnings of some people pass into the hands of others who consume them; or into the uses of labor and materials that become unproductive and perhaps eventually vanish.

Good Publicity Helps Public Relations

TO many minds publicity means advertising. In its present-day developments it means far more. A publicity director for a big organization or an organized industry finds that display space in newspapers and periodicals takes up a relatively small proportion of his time. Nevertheless, advertising pure and simple is an important factor in any campaign to educate the public on the advantages of a given material—steel, for example.

A publicity campaign for steel would involve much of such advertising; yet in the past only a few of the medium-sized producers have done anything in this line. Notable instances have been the campaigns for Armco products and for various special steels. Further good results cannot help flowing from the organized effort of the American Institute of Steel Construction.

Other industries certainly are not backward in this respect. Almost any issue of a metropolitan newspaper will clinch this point. Here, today, in the New York *World*, is a quarter-page advertisement by Westinghouse showing a welder at work on a building frame. It says, "Electrical Building Is Silent Buiding." Yet one might guess that the sales of welding equipment are an exceedingly small percentage of the entire Westinghouse business. Here's another quarter-page on pure copper screen cloth. Copper men generally agree that their joint publicity effort has done much to revive sales to the present high point. And a half-page by the New York Telephone Co.—a monopoly, with fixed rates! What have they to profit from advertising? A casual reader might think that this was money thrown away, even if he did not cynically and mistakenly refer it to an attempt to buy a paper's good will. Yet it is only part of a very astute policy for improving the public relations of this great and growing telephone industry.

It is time for the steel industry likewise to take thought of its public relations. As a group it complains that it cannot make a fair return on the money invested, but is not agreed on what to do about it. Whenever the Telephone company can prove it is not making a good return on its capital —and a good enough return to attract the vast amounts of additional money constantly needed for extensions—it presents its facts to the Public Service Commission and receives permission to raise the rates.

Not that the steel industry should invite governmental control. We only cite the Telephone company as an example of what a good publicity or public relations policy can do toward converting a natural antipathy to a monopoly into a friendly public feeling, even when the pocketbook is touched.

Steel could start without that handicap, for it is traditional that steel is a reliable material. "True as steel" grows out of centuries of satisfactory service. Such an asset could be easily expanded.

Brighter Prospects for Gray Iron

SIGNIFICANT changes in the gray iron industry are in the making. Along with the formation of the Gray Iron Institute has come a technical development of importance in the growing belief that improvement in the quality of cast iron lies in part at least in the perfection of methods of getting high temperatures. In recent months iron foundrymen have fully realized that the industry is facing a crisis. At the great convention in Philadelphia last month there was open discussion of the inroads of substitutes for gray iron and the grave necessity for improving the quality of the cupola product.

For the first time research on a large scale is to be applied to the industry. This will be part of the work of the new institute, which will also seek means of combatting substitutes and promulgating the advantages of gray iron castings. None too early is such organized research coming to the help of the iron foundry.

In his comprehensive paper of two months ago before the meeting of European foundrymen in Spain, published in part on other pages, Dr. Richard Moldenke ably reviews the situation and discusses in detail the benefits of superheating. This new development is the work of a leading German metallurgist whose thesis is that high temperatures destroy graphite nuclei so that the resulting metal on cooling has a finer structure and greater strength. In making the process commercial recourse naturally was had to new equipment for the cupola by which higher temperatures can be obtained. One of the most recent types, the

powdered coal cupola, was described in THE IRON AGE of June 7, and others designed to secure hotter blast appeared in earlier issues.

Manufactures Gain in Foreign Trade

THAT American manufactures are holding their own in world markets is made apparent from returns of the first quarter of 1928. Exports of finished manufactures, semi-finished manufactures and manufactured foodstuffs all increased, while exports of crude materials and of crude foodstuffs decreased. The manufactured or partly manufactured products constituted 70.6 per cent of the total value of exports in 1928, against 66.3 per cent in 1927. At the same time, the manufactured groups rated almost precisely the same proportion of the import total in the two years, having been 47.7 per cent in 1928 and 47.5 per cent in 1927.

In studying the balance between exports and imports for these quarters, and averaging them, it is seen that exports of finished manufactures exceeded imports by about $300,000,000. This was partly offset by excess of imports of crude materials, $100,000,000, and of crude foodstuffs averaging $85,000,000, in the two quarters. There was a slight export excess of manufactured foodstuffs and a slight import excess of semi-finished manufactures, leaving a total export surplus of some $110,000,000.

Steel Capacity and Competition

RATHER invidious comparisons are sometimes made, usually by steel producers themselves, between the degree of competition in the sale of steel products and the "rate at which the steel industry is operating." We quote the words with a view to pointing out the fallacy of the conception they express when the connection refers to the sale of finished steel products.

The operating rate so often cited is a percentage obtained by dividing steel ingot production by assumed steel ingot making capacity. The American Iron and Steel Institute statistics showed operations at 91.29 per cent for April and at 82.58 per cent for last month.

But the steel mills do not sell their ingots. They finish the steel into various forms, or sell semi-finished steel to detached finishing mills. Only the two largest producers make all the important finished products. In some lines, particularly sheets, tin plate and strips, a large tonnage is produced by mills which make only the one product, or very few products.

Each finished steel product makes its own market, and that is where the competition is. A steel producer may find competition in one given finished product which he feels bound to meet, quite irrespective of whether his ingot production is at one percentage rate or another.

The fact which these references to general operating rates ignore, and improperly ignore, is that the finishing capacity of the steel industry materially exceeds its steel ingot producing capacity. Estimates of the excess commonly made are 20 to 30 per cent, there being no attempt at anything like a precise statistical statement.

If the steel industry were operating "full," as the term would go, i. e., producing all the ingot tonnage possible, the whole group of finishing departments could not be running full. As a corollary, if it were possible to determine accurately the total finishing capacity in each product, and divide that into the actual tonnage being produced, the weighted averages of these percentages would fall quite short of the percentage rate of ingot production. If there is an ingot producing rate of 83 per cent there is, presumably, a 20 per cent excess of capacity, but in such a circumstance some finishing departments would have more than a 20 per cent excess. Market history illustrates the matter. In the old days "steel," which meant ingots, sometimes became scarce, and all prices tended to rise. If there were a heavy demand for plates and a light demand for shapes, the latter would rise because the management would allocate ingots to the plate department rather than the shape department.

CORRESPONDENCE

Dropping Absentees from the Payroll

To the Editor: I would like to add a few thoughts on the above subject to those so well expressed in the editorial in THE IRON AGE of May 31. There is nothing more prejudicial to discipline and more disturbing to routine than repeated absences, and of the work factors it is one of the most difficult to control. The suggestion in the editorial that the worker's name be removed from the payroll after two weeks absence, for any cause whatsoever, is a good one, providing justice is shown the employee by having an investigation made to see whether he is under too much of a physical strain either in his work or at home.

Employers who have accomplished most in combating absenteeism put much faith in prompt investigation of cases. A nurse sent to the homes of absent employees to offer assistance to any who are ill also brings back a full report of each case.

The instance cited, of dropping the worker's name from the payroll, after two weeks absence, will not jeopardize the man's chance at his job if his services have been satisfactory. When he is ready to reenter he will be taken back. Absentees should be required upon their return to go through a physical examination at the employment office and make application as if they were new employees. This method will prove measurably effective and particularly beneficial in reducing absenteeism and bettering the attendance records.

Absenteeism takes on an added importance because of its more definite effect upon production and the efficiency of the organization as a whole. A high frequency of absence is merely a prelude to leaving.

Every effort should be made to alter home or working conditions that prevent a worker from being regular at his work, even if it is necessary to give him a short vacation out of season. Working on this same system, some companies reward regular attendance either by a small bonus or by an addition to the vacation period. Investigation will prove that the better type of workman is not voluntarily absent. An employee who is "soldiering" on his job should not be retained on the payroll.

Some companies resent the use of a bonus system as an incentive to regularity in attendance because it seems inconsistent. They feel that to engage a person for a position and then have to offer additional incentives to have him regular in his attendance is wrong in principle.

In my opinion, the better way to control absenteeism is through good supervision which understands its obligation to the management. Make the worker understand that punctuality and regular attendance reflect dependability, which is taken into consideration in raising salaries and making promotions. If the

workman's record is unsatisfactory and he is content to let it remain so, the best solution ever found is removal from the payroll. H. K.

Philadelphia, June 4.

Need of Laboratories of Research on Marketing Problems

To the Editor: For the last year or two—or at any rate since the making of profits has become more difficult than the making of sales—the thoughtful men in the steel and allied industries have been pointing out the need for new methods of solving our commercial problems. E. G. Grace, president of Bethlehem Steel Co., some time ago advocated "better merchandising" for the steel industry. O. H. Cheney, banker, in a recent address to the Flat-Rolled Steel Executives said that "the two weapons in winning new markets are research and education." Charles F. Abbott, executive director of the American Institute of Steel Construction, has been talking to steel men and others all over the country on the need for viewing our commercial problems in a new light. In the June 14 issue of THE IRON AGE he was quoted as saying that "the problems of production and financing industry have been largely solved," but that the new conditions we are facing in business, owing to increased competition, call for "a radical readjustment of merchandising policies."

Business leaders are not worried as to the ability of the country to produce cheaply per unit of output, but they are worried—or should be—as to how they are going to market all that they can make and sell it at a profit. Individual companies, for the most part, have not found the way to solve their commercial problems as they have solved their production problems. There are some splendid examples of laboratory research as applied to commercial problems in such organizations as the General Motors Corporation, General Electric Co. and others, but the rank and file of American manufacturers, either individually or in groups, have done little on the commercial side of their business comparable with the research or experimental laboratory for the production department. One of the greatest weaknesses of American business today is its slowness to grapple with new problems and new conditions that have to do with merchandising.

Commercial problems require the same thorough analysis as those of production. A fundamental necessity in their solution is a laboratory of commercial research. Some of these problems usually command attention at sales or executive conferences, but conferences fall short of the ideal in that sales and other executives are usually too busy with the everyday affairs of getting and shipping orders to devote the time to a thorough study—research, if you like—of the matter at issue.

The work of a commercial research department should be constructive research into all the consumption and selling problems that affect the corporation's earning power and profits. The personnel should consist of men having a thorough understanding of business and economic laws, keen powers of analysis, the imagination to visualize consumption possibilities and an appreciation of all that is involved in the creation of profits. Such specalists should be free from duties of an executive or selling character, and should be in a position to give unbiased judgment, after thorough investigation, to the executive and sales departments.

A laboratory of commercial research, in addition to its own distinctive work, should act as a clearing house for information gathered by the various executive departments and should be able to sift and coordinate such information so that it will better assist the executives in separating essential profit-making factors from the non-essential.

Sales activities are too largely confined to current needs. It is a great mistake not to study concurrently market tendencies and to create a background for future earning power. Among the subjects to which a laboratory of commercial research should apply itself are these:

Determining the actual and potential demands for product within local and adjacent territories.

Remedy for failure to get orders or inquiries and to obtain volume of business desired.

Remedy for failure to appraise trends of business.

Remedy for failure to obtain price for product that will insure adequate return to stockholders.

Elimination of useless and unfair competition within the industry.

New methods of marketing.

New uses for products manufactured.

Developing consumer understanding of the merits of the product.

Forecasting and preparing data for future policies.

Many of these functions, it may be said, are now taken care of by one department or another. If research is handled by the department in which a problem originates, it may lack the right perspective and only represent the thoughts and traditional viewpoints of the head of the department. It would also divert the time of the head of the department from customary duties; or the work might be slighted and given only intermittent attention. The department is likely also to touch lightly on its own weak spots. Its objective may be to confirm the pre-determined opinions of the head of the department, when the aim should be to arrive at an independent analysis.

O. W. MASON.

29 Broadway, New York.

Leading Interests Combine for Steel Exports

United States and Bethlehem Steel Subsidiaries Become Members of Steel Export Association of America

WASHINGTON, June 19.—With the United States Steel Products Co. and the Bethlehem Steel Export Corporation as member companies, the Steel Export Association of America has filed papers with the Federal Trade Commission under the Webb-Pomerene act for exporting iron and steel products. Announcement was made today of the fact by the Commission.

The new association became automatically organized on the filing of the papers. It will have headquarters at 25 Broadway, New York. There will be four managers and a secretary and assistant secretary, according to the papers as filed. The managers are S. M. Bash and W. H. Stewart of the Bethlehem organization and G. C. Scott and Frank Adams of the Steel Corporation subsidiary. William J. Brown, who is assistant treasurer and assistant secretary of the Bethlehem Steel Corporation, is named as secretary, and Arthur C. Mundle, of the Steel Corporation, as assistant secretary.

The combined exports of rolled steel of the two members of the association account for 75 to 80 per cent of the total outgo from the country. No statements could be obtained from the two companies beyond unofficial observations that the move is experimental.

United States Patent No. 1,668,705 was issued May 8 to Thomas S. Wheelwright, Richmond, Va., for a method of rolling hollow steel bars from ingots or fagots. The patent has been assigned to the Old Dominion Iron & Steel Works, Richmond.

Iron and Steel Markets

Seek Economies in Marketing

Two Leading Steel Producers Unite for Exports—Pig Iron Makers and Mills Make Greater Use of Inland Waterways—Steel Output Retains Lead Over 1927

THE week has brought out new evidences of the attention producers of iron and steel are giving to economies in marketing. To cultivate foreign trade more effectively the Steel Corporation and the Bethlehem company have formed a common export organization, thereby providing a single outlet for 75 to 80 per cent of the rolled steel shipped out of this country. In domestic business, makers of both pig iron and steel are using waterways more extensively in an effort to expand market zones fixed by railroad rate barriers.

The largest structural steel contract in weeks, 38,000 tons, for the Mercantile Mart, Chicago, was placed with the Bethlehem Steel Co. for fabrication at Buffalo and delivery by Lake vessel. Ohio River shipments of iron and steel from Pittsburgh district plants were the largest on record in May, and in the first five months of this year totaled 458,500 tons, or two and a half times the movement in the corresponding period last year.

In the East, water shipments of merchant pig iron are in increasing volume, and the Buffalo producers have acquired storage space at New Jersey ports to extend the advantages of barge rates through the winter months.

Steel production, although receding, is holding its lead over output last year. At Chicago, operations have declined to 83 per cent of capacity, against 80 per cent in the same week of 1927, and in the Greater Pittsburgh district a rate of 70 per cent compares with 65 per cent 12 months ago.

With output still on a relatively high plane, a good volume of bookings is indicated. The bulk of current business, however, is made up of releases against past commitments. Both specifications and new orders are growing individually smaller, at the same time calling for prompter shipment.

Consumers are showing little interest in third quarter requirements and, since current buying is limited principally to small fill-in tonnages, mill prices remain largely untested. Makers of plates, shapes and bars continue to take early shipment business at 1.85c., Pittsburgh, and are more concerned about getting specifications against existing contracts than forcing the issue on their recent advance of $1 a ton on third quarter business. In the Chicago district, where the sheet market has been particularly quiet, prices are off $1 and $2 a ton respectively on the black and galvanized finishes.

Producers of wire nails are finding it increasingly difficult to establish a price of $2.65 per keg, Pittsburgh or Cleveland, and $2.55 is more commonly quoted.

Makers of welded boiler tubes have announced a revision of supplementary discounts, advancing net prices on steel tubes about 5 per cent and on charcoal iron tubes nearly 2½ per cent.

Increased inquiry for pig iron in the Pittsburgh district, no doubt stimulated by the recent drop in the price of Valley basic, has been followed by stronger efforts by producers to stiffen prices, with the issue somewhat in doubt.

Scrap is weak, and at Pittsburgh and Chicago prices on heavy melting steel have declined 25c. a ton.

The placing of 50,000 tons of line pipe by the Empire Gas & Fuel Co. has enlivened a dull situation in tubular goods. A number of other large line-pipe projects still await financing, but early action is looked for on 12,000 tons of steel water pipe for the city of Denver.

Large individual projects feature the structural steel market. For one of them, the Mercantile Mart at Chicago, 38,000 tons was placed during the week, and two others in that city will call for a total of 150,000 tons more. Railroad grade elimination work at Cleveland will require 15,000 tons, and a store building at Philadelphia will take 10,000 tons.

Steel specifications from several of the automobile companies in the Detroit district are lighter, but forge shops and other makers of automotive parts in northern Ohio have made no curtailment in production. Chicago reports no recession in the operations of farm equipment makers, indicating that several did not interrupt production to take inventory. Road machinery builders are also very busy.

Orders for fabricated structural steel in May, at 315,000 net tons (computed), made the second highest monthly total ever reported, exceeded only by the 345,000 tons of last July. Computed shipments ran 49,000 tons behind orders, but made the fourth highest month's total.

At 46⅝c. a lb., New York, spot Straits tin sold today at the lowest level since Sept. 24, 1924. Large sales in the Far East and absence of consumer buying here and in London are given as prime causes.

Both of THE IRON AGE composite prices remain at the levels of the past two weeks. That for finished steel is at 2.341c. a lb., about 1 per cent lower than a year ago. That for pig iron, at $17.23 a ton, is 9 per cent below the $18.96 of last June.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Jun.19, 1928	Jun.12, 1928	May 22, 1928	Jun.21, 1927
No. 2, fdy., Philadelphia..	$20.76	$20.76	$20.76	$21.76
No. 2, Valley furnace....	16.75	16.75	17.25	18.00
No. 2, Southern, Cin'ti...	19.69	19.69	19.19	21.69
No. 2, Birmingham.....	16.00	16.00	15.50	18.00
No. 2 foundry, Chicago*..	18.00	18.00	18.00	20.00
Basic, del'd eastern Pa. ..	19.00	19.00	19.00	20.75
Basic, Valley furnace....	15.35	15.35	16.00	18.00
Valley Bessemer, del'd P'gh	18.76	18.76	18.76	20.76
Malleable, Chicago*	18.00	18.00	18.00	20.00
Malleable, Valley	17.00	17.00	17.25	18.00
Gray forge, Pittsburgh...	18.01	18.01	18.51	19.26
L. S. charcoal, Chicago...	27.04	27.04	27.04	27.04
Ferromanganese, furnace.	105.00	105.00	105.00	90.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill.	$43.00	$43.00	$43.00	$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh..	32.00	32.00	33.00	33.00
O.-h. billets, Pittsburgh..	32.00	32.00	33.00	33.00
O.-h. sheet bars, P'gh....	33.00	33.00	34.00	33.50
Forging billets, P'gh.....	38.00	38.00	38.00	39.00
O.-h. billets, Phila.....	38.30	38.30	38.30	39.30
Wire rods, Pittsburgh....	42.00	42.00	44.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.80
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.12
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh....	1.85	1.85	1.85	1.80
Steel bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, New York....	2.19	2.19	2.19	2.14
Tank plates, Pittsburgh..	1.85	1.85	1.85	1.80
Tank plates, Chicago.....	2.00	2.00	2.00	2.00
Tank plates, New York...	2.17½	2.17½	2.17½	2.09
Beams, Pittsburgh	1.85	1.85	1.85	1.80
Beams, Chicago	2.00	2.00	2.00	2.00
Beams, New York.....	2.14½	2.14½	2.14½	2.04
Steel hoops, Pittsburgh...	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Jun.19, 1928	Jun.12, 1928	May 22, 1928	Jun.21, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.65	2.65	2.70	3.00
Sheets, black, No. 24, Chicago dist. mill.....	2.75	2.80	2.80	3.10
Sheets, galv., No. 24, P'gh	3.50	3.50	3.55	3.85
Sheets, galv., No. 24, Chicago dist. mill.....	3.60	3.70	3.70	3.95
Sheets, blue, 9 & 10, P'gh	2.00	2.00	2.00	2.25
Sheets, blue, 9 & 10, Chicago dist. mill.....	2.10	2.10	2.15	2.35
Wire nails, Pittsburgh....	2.55	2.55	2.55	2.50
Wire nails, Chicago dist. mill	2.60	2.60	2.70	2.55
Plain wire, Pittsburgh...	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh..	3.35	3.35	3.35	3.20
Barbed wire, galv., Chicago dist. mill.....	3.40	3.40	3.40	3.25
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh.	$14.50	$14.75	$15.00	$14.75
Heavy melting steel, Phila.	13.50	13.50	13.50	14.00
Heavy melting steel, Ch'go	12.50	12.75	13.00	12.00
Carwheels, Chicago	13.00	13.00	13.50	13.50
Carwheels, Philadelphia ..	15.50	15.50	15.50	15.50
No. 1 cast, Pittsburgh....	14.25	14.25	14.50	15.00
No. 1 cast, Philadelphia..	16.00	16.00	16.00	16.00
No. 1 cast, Ch'go (net ton)	14.00	14.00	14.00	14.50
No. 1 RR. wrot, Phila....	13.50	13.50	15.00	16.00
No. 1 RR. wrot, Ch'go (net)	11.25	11.50	11.75	11.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt....	$2.60	$2.60	$2.60	$2.90
Foundry coke, prompt....	3.75	3.75	3.75	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.87½	14.87½	14.62½	12.62½
Electrolytic copper, refinery	14.50	14.50	14.25	12.25
Zinc, St. Louis.....	6.15	6.15	6.15	6.20
Zinc, New York.....	6.50	6.50	6.50	6.55
Lead, St. Louis.....	6.15	6.15	5.97½	6.10
Lead, New York.....	6.30	6.30	6.10	6.40
Tin (Straits), New York..	46.62½	48.62½	51.50	67.37½
Antimony (Asiatic), N. Y.	9.62½	9.75	11.00	12.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Pipe Orders for 50,000 Tons—Steel Business Sustains 70 Per Cent Operations

PITTSBURGH, June 19.—Steel manufacturers in this district still report a good aggregate business, although also noting that demand shows the downward tendency common to this time of the year, and that only through sustained sales effort are orders kept flowing in. Buyers are not yet showing much interest in third-quarter requirements and the bookings are made up of a large number of small and miscellaneous tonnages, almost all of which carry prompt shipping instructions. Lack of interest in supplies beyond the end of the quarter probably is explained by the fact that important consumers are generally covered to the end of this month and have until that time to specify shipments that will meet their July needs. Steel ingot production is right around 70 per cent of capacity.

Distribution of orders among the different products is uneven. Common finishes of sheets appear to be doing a little better in point of releases on contracts than they did recently, and some makers of wire products note a gain in orders over the past week. Quotation of $2.55, base, per keg, Pittsburgh, on nails has become a little more common and probably has been accompanied by larger sales, and in sheets, buyers appear to believe that prices cannot go very much lower than they are now.

Not much structural steel business is coming out, but this is a natural condition at this time when work placed in the spring is well under way and it is early for much demand inspired by a desire to have the structure under cover before winter. The pipe market has been enlivened by an order for 50,000 tons of line pipe. Steel bars are doing fairly well and business is called good in reinforcing bars. There is no noticeable letdown in the specifications for tin plate.

The recent break in the price of basic pig iron has somewhat intensified interest in third-quarter requirements of that grade and stimulated the inquiry for other grades. Actual business, however, is limited by the fact that producers have stronger price ideas than buyers expected to pay in the face of a price around $15.25, furnace, for basic grade.

Scrap prices show a tendency to ease off on account of a lack of consumer interest. Except for some renewing of existing supply arrangements in coke, the fuel situation remains dull and uninteresting.

Pig Iron.—Melters are beginning to evince some interest in their requirements for third quarter, and in view of the recent break in prices the inquiries are for larger individual tonnages than usual. Not much actual business has been done because buyers are trying to do as well on basic iron as was done recently by two Pittsburgh district steel makers, but find not only the steel companies but the merchant producers resisting. Efforts to buy other grades at prices more in line with the market on basic iron also encounter opposition by producers, but at the same time attempts to stiffen the market have not succeeded. One company, which has bought 6000 tons of basic iron since a week ago, was able to buy at less than $16, which several makers quoted; this company is known to have rejected a bid of

$15.75, Valley furnace, and, while the exact price has not become known, it is commonly accepted that it was not far from basis of the last previous sales. Follansbee Brothers Co. has entered the market for 10,000 tons of basic iron for third-quarter delivery, and the Colonial Steel Co. is taking prices on 2500 tons. Difference of ideas on prices between buyers and sellers is keeping down foundry sales. A Uniontown, Pa., melter recently closed on approximately 6000 tons of foundry iron, dividing the business among Johnstown, Pa., Valley and Cleveland furnaces. The delivery price was about $18.75, or $17.11, Johnstown, $16.48, Valley, and $15.85, Cleveland. Several producers still want $17, Valley furnace, for No. 2 foundry, but find it necessary to shade that price, since a good deal of iron held by middle interests is being offered for less.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$15.35 to $15.50
Bessemer	17.00
Gray forge	16.25 to 16.50
No. 2 foundry	16.75 to 17.00
No. 3 foundry	16.25 to 16.50
Malleable	17.00 to 17.25
Low phosphorus, copper free	26.50

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—With the approach of July 1, larger consumers of ferromanganese, who have been slow to sign second-half contracts, are swinging into line, and it is said that only one or two now remain uncovered for that period. At the same time, an effort to extend the former price as long as possible is seen in specifications against first-half contracts that are well in excess of current consumption. Makers of alloy steel are taking out spiegeleisen a little less freely, but the general movement of that alloy still is good. Ferrosilicon specifications are rather slow. Prices are unchanged.

Semi-Finished Steel.—Buyers of billets, slabs and sheet bars are exerting considerable pressure against prices and are meeting with some success, since sheet and strip prices still are weak and producers of semi-finished steel for the market appear to need business. Generally, $32, f.o.b. Pittsburgh, for large billets and slabs and $33 for sheet bars measures the limit of the price that has to be paid. Some producers with rather sizable yard stocks of billets have gone well under $32 to move or reduce them. There is a possibility that sheet bars will pass from the list of quotable steel products before a great while. Owners of the continuous mills are said to recognize that the market is not broad enough to take all the finished strips that could be produced and are figuring on selling a considerable tonnage of what may be designated as strip mill breakdowns (strips that have passed through the roughing rolls) to the makers of sheets and tin plate now rolling from sheet bars. Such a step would cheapen the cost of rolling sheets and black plate and incidentally delay obsolescence of present sheet and tin mills. Wire rods still are quoted at $44, base Pittsburgh, but are commonly selling at $2 a ton less.

Bars, Plates and Shapes.—An order for 50,000 tons of 10 in. and 20 in. line pipe, which has been placed with two local makers means an order for a like amount of plates and skelp. This will be a help to one of the market's quietest products, for while a fair tonnage is moving into river craft, the lack of railroad rolling stock orders has been felt. Structural steel lettings are showing the usual decrease common to this season and bar business is considerably lighter now than it was as recently as a month ago. While a good total tonnage of reinforcing bars is being booked in small lots, demands from bolt and nut makers and from makers of cold-finished bars are moderate. Buyers are having no difficulty in placing early shipment business in bars, plates and shapes at 1.85c., base Pittsburgh, and some shading of that price on plates is reported, probably to meeting strip competition. Mills still are more concerned about getting specifications against existing contracts than in forcing the issue with respect to third quarter contracts, on which most makers have announced a price of 1.90c.

Rails and Track Supplies.—Rail business continues to lag, but there is a fair amount of ordering of the track supplies. Prices are unchanged.

Wire Products.—So little success has attended the effort to establish nails at $2.65, base, per keg, Pittsburgh, that makers are getting a little more anxious for orders and $2.55 is becoming a more commonly quoted price. The products that move in price with nails likewise are seeking the minimum levels. But on plain wire, while there is some resistance to $2.50, base, per 100 lb., that price is ruling on a majority of the sales. Some producers report some improvement in business in the past week, but this is not the rule.

Tubular Goods.—The Empire Gas & Fuel Co. has divided between the National Tube Co. and Spang, Chalfant & Co. an order for 132 miles of 20 in. pipe and 14 miles of 16-in. welded pipe for a gas line and 362 miles of 10¾-in. seamless pipe for an oil line. The tonnage is estimated at 50,000 tons and constitutes the largest piece of business placed in several months. The Amarillo-Kansas City gas line for the Industrial Gas Co., Kansas City, is again being discussed; there are reports that the A. O. Smith Corporation, Milwaukee, has the order subject to financing, but another story is that a new company is under organization to make electrically welded pipe and is to get this line as its first order. Fair demand is reported for butt-welded pipe, but lapwelded goods still are dull.

Makers of welded steel and iron boiler tubes have announced a revision of the supplementary discounts in place of 7 fives beyond the card on steel tubes and 2 tens to 2 tens and five on charcoal iron tubes without much regard to the size of the order. The maximum supplementary discounts now entail purchases of at least 21,000 lb. For lots of 12,000 to 20,999 lb., the new supplementary discounts are 6 fives on steel tubes and 2 tens and two and one-half on iron tubes. On lots of 5000 to 11,999 lb., they are 5 fives and 2 tens, respectively, and for lots of less than 5000 lb., 4 fives and 1 ten, respectively.

Sheets.—While actual business leaves little to complain of as to volume, the price situation still is unfavorable from the manufacturers' viewpoint. On black sheets, 2.70c., base, is the limit on small lots and in this area, where prices seem to have held a little better than

The Iron Age Composite Prices

Finished Steel

June 19, 1928, 2.341c. a Lb.

One week ago	2.341c.
One month ago	2.348c.
One year ago	2.367c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

June 19, 1928, $17.23 a Gross Ton

One week ago	$17.23
One month ago	17.34
One year ago	18.96
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.75,	Feb. 14;	$17.23,	June 5
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	2.04c. to 2.09c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna	1.95c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.95c. to 2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.75c.
F.o.b. Chicago Heights mill	1.85c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	3.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.10c. to 2.15c.
F.o.b. Coatesville	2.00c. to 2.05c.
F.o.b. Sparrows Point	2.00c.
F.o.b. Lackawanna	1.95c.
Del'd New York	2.17½c. to 2.22½c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
F.o.b. Lackawanna	1.95c.
F.o.b. Bethlehem	2.00c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.06c. to 2.18c.
Del'd New York	2.14½c. to 2.19½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh	2.20c. to 2.30c.
From 3 in. to 6 in., P'gh	1.85c. to 2.10c.
6 in. and wider, P'gh	*1.75c. to 1.90c.
Narrower than 3 in., Chicago	2.30c.
From 3 to 6 in., Chicago	2.20c.
6 in. and wider, Chicago	2.00c.
Cotton ties, f.o.b. Atlantic and Gulf ports:	
Carlots per 45-lb. bundle	$1.27
2000 bundle lots	1.25
Larger lots	1.23

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, 1 up to 3 tons, P'gh	3.00c. to 3.15c.
Strips, 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, 1 up to 3 tons, Worcester	3.15c. to 3.30c.
Fender stock, Pittsburgh	4.10c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55 to $2.65
Galvanized nails	4.55 to 4.65
Galvanized staples	3.25 to 3.35
Polished staples	3.00 to 3.10
Cement coated nails	2.55 to 2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. P'gh	2.00c. to 2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.10c.
Nos. 9 and 10, del'd Cleveland	2.09c. to 2.19c.
Nos. 9 and 10, del'd Philadelphia	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham	2.20c. to 2.25c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.65c. to 2.70c.
No. 24, f.o.b. Chicago dist. mill	2.75c.
No. 24, del'd Cleveland	2.79c. to 2.89c.
No. 24, del'd Philadelphia	2.97c. to 3.07c.
No. 24, f.o.b. Birmingham	3.00c. to 3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.85c. to 3.90c.
No. 24, f.o.b. Pittsburgh, B grade	3.65c. to 3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.60c.
No. 24, del'd Cleveland	3.64c. to 3.69c.
No. 24, del'd Philadelphia	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham	3.80c. to 3.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.85c. to 2.90c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. maker's mill)
Alloy Quality Bar Base, 2.65c.

S.A.E. Series Numbers		Alloy Differential	Net Price 100 Lb. Bars
2000	(1¼% Nickel)	$0.25	$2.90
2100	(1½% Nickel)	0.55	3.20
2300	(3½% Nickel)	1.50	4.15
2500	(5% Nickel)	2.25	4.90
3100	Nickel Chromium	0.55	3.20
3200	Nickel Chromium	1.35	4.00
3300	Nickel Chromium	3.80	6.45
3400	Nickel Chromium	3.20	5.85
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50	3.15
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70	3.35
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05	3.70
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35	3.00
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45	3.10
5100	Chromium Spring Steel	0.20	2.85
6100	Chromium Vanadium Bars	1.20	3.85
6100	Chromium Vanadium Spring Steel	0.95	3.60
9250	Silicon Manganese Spring Steel	0.25	2.90
Chromium Nickel Vanadium		1.50	4.15
Carbon Vanadium		0.95	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1⅝ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 6 fives extra are given on lap welded steel tubes and 2 tens and 2½ on charcoal iron tubes on lots of 12,000 lb. and more.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1⅝ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

in other districts, 2.65c. now is the ruling price. On galvanized sheets, 3.50c., base, now is being quoted by several producers who hitherto have refrained from going under 3.60c., on the score that 3.50c. referred chiefly to sheets for roofing and siding, in which there was more or less "cheating" as to gages. Orders as a whole are numerous enough, but they usually are for small lots and in all cases are for quick rolling and shipment. Mill operations are off about five points and now are placed at 70 to 75 per cent of capacity.

Tin Plate.—The fact that the packing crops are two to three weeks late takes some of the urgency out of the demand for tin plate, but the expectations still are strong that the pack will be large and container manufacturers are taking shipments on contracts very steadily. Shipments of tin plate for all uses so far this year are sufficiently ahead of those for the same period last year to sustain early estimates that the year would run in shipments about half way between 1927 and 1926.

Cold-Finished Steel Bars and Shafting.—Demand still is more remarkable for its steadiness than its size. Viewed from the potential productive capacity, business is only fairly active, but the demand for several years has been below rather than abreast of full capacity. There are few deviations from 2.20c., base Pittsburgh.

Bolts, Nuts and Rivets.—Current demands are only moderately large, but are spread out well enough to maintain a steady flow of orders. Prices are well maintained.

Hot-Rolled Flats.—Producers in this district find that business so far this month is little, if any, behind that of the same period last month, and are well satisfied. There is little real change in prices. Those for third quarter will be largely the same as those that have ruled in this quarter. To the small tonnage buyers, they are 1.90c., base, for widths 6 to 12 in., 2.10c. for 3 to 6 in., and 2.20c. for widths under 3 in. Large tonnage buyers in the past quarter have had concessions of $2 to $3 a ton from these prices and there is no evidence in the business done so far that they will get any greater concessions in the coming quarter.

Cold-Rolled Strips.—Business is holding up fairly well with local producers and prices are quite steady.

Warehouse Business.—Prices have been cut $2 a ton on black and galvanized sheets in keeping with the recent decline in mill prices. The regular schedule on other products is being well observed by warehouses, but mill supply houses continue to do some shading. Business is fairly good as a whole.

Coke and Coal.—Foundries have been contracting for third-quarter and last-half requirements and most of them using beehive oven coke are now under cover for those periods. In the choice brands, the business has been at $4.50 to $4.85 per net ton at ovens. Blast furnaces also are understood to be renewing agreements with present sources of supply and continuing the present price of about $2.75 per net ton at ovens. Spot business does not amount to much and prices are unchanged. The coal market has not yet felt the stimulation of an increased large cargo demand that was expected to result from the confirmation by the Interstate Commerce Commission of the reduction of 20c. a ton made by Northern railroads. Lake shippers evidently are waiting to see whether the last word yet has been spoken in connection with rates before buying. There is now a differential of 45c. a ton between Northern and Southern rates and there is a possibility that Southern roads may take another step in reducing that spread in an effort to help the Southern mines.

Old Material.—Prices continue soft in this market, but as a rule this condition is due more to consumer indifference than to heavy offerings. The weakest grade is machine shop turnings, which the principal local user continues to buy at $9 and dealers with short contracts to cover are able to get at $9.25, although sales in the Detroit district are reported at $5.60, which would mean $9.60 if they were delivered into this district. There is a suspicion that sales are being made at a low price here to affect contract settlements based upon the price at Pittsburgh. On heavy melting steel $14.75 appears to be as high as can be done and some melters have turned it down at that price. Dealers are picking up small lots of ordinary heavy melting steel down to $14 for shipment to one point in the district, but purchases cannot be made that low for other deliveries.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$14.25 to $14.75
Scrap rails	14.00 to 14.50
Compressed sheet steel	14.00 to 14.50
Bundled sheets, sides and ends	13.00 to 13.50
Cast iron carwheels	14.00 to 14.50
Sheet bar crops, ordinary	15.00
Heavy breakable cast	12.00 to 12.50
No. 2 railroad wrought	14.50 to 14.75
Heavy steel axle turnings	12.50 to 13.00
Machine shop turnings	9.00 to 9.25
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	15.50 to 16.00
Railroad coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phosphorus billet and bloom ends	19.00 to 19.50
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	12.50 to 13.00
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Short shoveling steel turnings	10.50 to 10.75
Short mixed borings and turnings	10.50 to 10.75
Cast iron borings	10.50 to 10.75
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades:	
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	10.50 to 11.00
Sheet bar crops	16.50 to 17.00
Cupola Grades:	
No. 1 cast	14.25 to 14.50
Rails 3 ft. and under	15.50 to 16.00
Malleable Grades:	
Railroad	14.25 to 14.50
Industrial	13.75 to 14.00
Agricultural	13.25 to 13.50

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.55c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.40c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	$4.31
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, per 100 count	60 per cent off list
Carriage bolts, per 100 count	60 per cent off list
Nuts, all styles, per 100 count	60 per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	$3.00 to 3.10
Wire, galvanized soft, base per 100 lb	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Portable Testing Instruments

A new line of portable alternating current instruments designated as type PY5, applicable for general testing and laboratory work where high accuracy is required, is announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The line includes voltmeters and single-phase wattmeters of the electrodynamometer type, and ammeters of the moving iron type, using vanes of non-residual metal. All instruments are shielded and are equipped with an improved design of air damper, making possible accurate measurements on fluctuating loads.

Production of bituminous coal in the week ended June 9 is reported by the United States Bureau of Mines at 8,412,000 net tons, making a total of 209,112,000 tons for the elapsed portion of the calendar year. The figures compare with 8,524,000 tons in the corresponding week of 1927 and 251,666,000 tons for the year to that date.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$32.00 to $33.00
Rerolling, under 4-in. to and including 1¾-in.	33.00 to 34.00
Forging, ordinary	38.00
Forging, guaranteed	43.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$33.00 to $34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$32.00 to $33.00
Smaller than 8 in. x 2 in.	33.00 to 34.00

Skelp

	Per Lb.
Grooved	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00 to $44.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $45. Cleveland mill base, $44.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron,	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.00 to $11.25

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.60 to $2.75
Foundry, f.o.b. Connellsville prompt	3.50 to 4.25
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.05
Gas slack, f.o.b. W. Pa. mines	1.10 to 1.15

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$16.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Large Structural Jobs—Third Quarter Prices Not Yet a Fact—Operations at 83 Per Cent

CHICAGO, June 19.—Of outstanding interest in this market is the placing of 38,000 tons of fabricated steel with the Bethlehem Steel Co. for fabrication at Buffalo and delivery by water to the site of erection of the Mercantile Mart in Chicago. It is also now learned that the Starrett Building Co. has been awarded the general contract for the Apparel Mart, Chicago, which will contain 4,650,000 sq. ft. of floor space, covering two city blocks and extending upward 75 stories.

No. 11 blast furnace at Gary was blown out last Saturday, thus reducing to 18 the number of active stacks in blast at plants of the leading producer. The count for the district now stands 26 active and 10 out of service. At St. Louis the "A" furnace has been taken out of service, reducing by half the output of merchant iron in that district.

Sales of steel mill products in the week now closing show a decided improvement over the average for the early part of June, but individual orders are small and there is a general lack of interest in forward contracting. Producers recognizing this fact plus the uncertainty of trends in other territories are hesitating to name third quarter prices. Specifications are heavier, but when averaged with the two previous weeks show a total volume which warrants not more than 83 per cent of ingot capacity being used. The Omaha lines of the Chicago & North Western has placed an order for 250 stock cars.

Pig Iron.—Melt in this district is smaller by a small margin, and with lighter shipments and a general lack of interest in forward buying, the local trade has come to the opinion that hand-to-mouth buying and a quiet summer are in prospect. A 3000-ton inquiry is open in western Michigan and a 500-ton lot will be purchased by a northern Illinois user. Although there is a quiet tone to this market, nevertheless shipments so far this month compare favorably with June a year ago. Furnace stocks of Northern iron are steadily being reduced but can still be considered large for this time of the year and the general condition of the market.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.50
Malleable, not over 2.25 sil.	18.00
High phosphorus	18.00
Lake Superior charcoal averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	21.51
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Fluorspar.—Several carload inquiries are before the local trade. Asking prices are $16 a net ton, f.o.b. Illinois and Kentucky mines.

Ferroalloys.—Announcement is made by producers that third quarter prices on the 19 to 21 per cent grade of spiegeleisen will be $33, Hazard, Pa. The local market is quiet except for the resale of a carload at $32.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $37.76 to $39.76.

Plates.—The local plate market is quiet, largely as a result of the dullness in railroad equipment and oil storage tank buying. Specifications from the manufacturing trade are steady, and fabricators, whose shops are well filled, continue to take liberal quantities. Cheyenne, Wyo., has decided to buy cast iron water pipe and has withdrawn an inquiry for steel pipe which would have taken 6000 tons of plates. After some delay the way now appears to be clear for action on 12,000 tons of steel water pipe needed by the city of Denver. Western car shops are engaged on the last of the large equipment orders and at this moment there is no new business in sight that will sustain operations to mid-summer. The Missouri Pacific plans to build 200 automobile cars in its own shops. The Ohio Collieries Co. has ordered 250 mine cars from the American Car & Foundry Co. Western steel mills expect to participate in the steel required for 600 cars that will be built in the Southern Pacific shops, but they have little else to look forward to except 250 cars for the Omaha lines of the Chicago & North Western and a like number of gondola bodies for the Rock Island. Plate deliveries range three to six weeks. Local producers still hesitate to announce first third quarter prices and in the meantime the general market is quotable at 2c., Chicago.

Mill prices on plates, per lb.: 2.00c., base Chicago.

Structural Material.—The real support of this market, that is, jobs of average size, is being forgotten for the moment in the concern over three larger projects, which will require well toward 200,000 tons of steel. The mercantile mart, taking close to 45,000 tons of structural steel and 6000 tons of reinforcing bars, is active and it is entirely probable that contracts will be placed before the end of the week. Indications are that Eastern mills and fabricators are interested in tonnages of this size and that Western shops are not having clear sailing, merely because the building is to be located in Chicago. Some headway is being made with the plans for the agricultural mart. The third large project and the newest one of the three is a 75-story structure, housing a thousand room hotel, for which the promoters have obtained air rights over the river terminal of the Illinois Central Railroad. This building is to be known as the Apparel Mart. The Mississippi Valley Structural Steel Co. has taken 900 tons for two buildings for the University of Illinois, and the Hyde Park State Bank Building, Chicago, requiring 500 tons, has been awarded to the Union Foundry, a local shop. Fabricators in this district are comfortably booked and projects are quite numerous. Structural material prices are 2c., Chicago, to the general trade and to fabricators for stock, but the bulk of the tonnage going into steel frame buildings commands lower prices.

Mill prices on plain material per lb.: 2.00c., base, Chicago.

Bolts, Nuts and Rivets.—Third-quarter contracting is progressing with little opposition to prices asked. Some improvement in specifications from the railroads is noted.

Reinforcing Bars.—The recession in reinforcing bar sales noted several weeks ago is still in evidence, though in the last few days an increased number of small orders has been taken by local dealers. Purchases are disproportionately small in comparison with the pending list. The scarcity of business results more from the slowness with which general contracts are placed than from delay by contractors in making purchases. Plans for the Palmolive-Peet Building, Chicago, are being revised to include a 20-story tower, which will add about 100 tons to the reinforcing bars required. Prices on concrete bars in and near Chicago are steady at the full schedule, but in central Illinois keen competition is bringing out low quotations. New orders and fresh projects are shown on page 1792.

Bars.—Although other heavy tonnage finished steel products are receding in demand, shipments for soft steel bars are going forward at an undiminished rate. As far as local producers can tell there is no letup in either the manufacture of automobiles or in accessories. Road machinery builders are busy and farm implement manufacturers are operating plants at capacity. It is said that several farm equipment builders did not take inventory, at least of such character as would necessitate curtailment of production. Reports from tractor builders indicate that orders continue to pile up. Prices in and near Chicago remain at 2c. on mild steel bars, but in outlying territory producers from other districts do not maintain this level. Railroads are taking larger quantities of iron bars and prices are steady at 2c., Chicago. Specifications for alloy steel bars afford output at mills' capacity. Prices are unchanged and third quarter books are open. Current

purchases for the most part are for immediate requirements. The advance to 1.90c., Chicago Heights, on rail steel bars has failed and future business is being taken at the old quotation of 1.85c. Local mills are operating at capacity and are not able to make deliveries in less than three weeks except when orders match with rolling schedules. Demand for fence posts is brisk and shipments already made this month, plus specifications that are now in, foretell that deliveries in June will be the largest for any month so far this year.

Mill prices per lb.: Soft steel bars, 2.00c., base, Chicago; common bar iron, 2.00c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

Wire Products.—The jobbing trade is moving rather slowly and somewhat spotty except in woven wire fence. Rains throughout the Middle West have benefited crops, though in some sections of the Missouri River Valley hail storms have destroyed much wheat. New purchases by the manufacturing trade are in small volume, but specifications are steady and shipments to that class of buyers in the last two weeks average well above the last 14 days in May. Wire mill operations remain remarkably steady, close to 65 per cent of capacity still being engaged. Stocks in the hands of users are not oversized, while at mills readjustment of output is keeping stocks well balanced. Prices for wire and wire products are shown on page 1777.

Rails and Track Supplies.—Chicago district rail mill output has been cut to 80 per cent of capacity. Miscellaneous orders for track fastenings total 5000 tons, and inquiry, including the 12,000 tons required by the Pennsylvania Railroad, reaches to not less than 16,000 tons. The iron tie plate market is quiet, though several railroads are shaping inquiries for this commodity. Light rail business is confined to scattered carlot orders.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Hot-Rolled Strip.—Price cutting in the Detroit district is in evidence and as low as 2.15c., base, per lb., Chicago, has been named in this market for widths of less than 6 in.

Cast Iron Pipe.—This market is showing added life and prices are steady at $32 to $33, Birmingham, for 6-in. and larger diameters. The Lynchburg Foundry Co. has taken 350 tons of 6 and 8-in. pipe for Fond du Lac, Wis., at $42.45, delivered, or $31.95, Birmingham. The United States Cast Iron Pipe & Foundry Co. has taken 350 tons for Fox River Grove, Ill., and the McWane Cast Iron Pipe Co. has closed for 200 tons for Cynthiana, Ind. Fresh inquiry includes 1000 tons of 6 to 24-in. pipe for West Allis, Wis., 400 tons of 6 and 8-in. pipe for Winfield, Ill., 500 tons for Columbia, Ill., and 115 tons for Chillicothe, Ohio. Pending business at St. Paul, Chicago and at Roseville, Mich., is still open. The last named job may be closed in a day or two.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $40.20 to $41.20; 4-in., $44.20 to $45.20; Class A and gas pipe, $4 extra.

Sheets.—Prices for this commodity have given ground and even at the new low levels there is lack of strength. Chicago prices now are 2.80c. for black, 3.65c. for galvanized and 2.15c. for the blue annealed product. These prices are being used almost wholly for current business, which is of small proportions, and for contract tonnages when the buyer will make out a shipping schedule at the time of purchase. Local producers have not announced price policies for the third quarter. Hot mill output is at the low point of the year and schedules are difficult to maintain. Deliveries are prompt on all grades, except blue annealed sheets, which at this moment are in the best demand.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 2.80c.; No. 24 galvanized, 3.65c.; No. 10 blue annealed, 2.15c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Coke.—Producers of by-product foundry coke have announced second half prices at $8, f.o.b. local ovens, and $8.75, delivered in the Chicago switching district. Shipments in June are running behind those in May and forward contracting is only moderately active.

Old Material.—A steel mill has closed for 16,000 tons of heavy melting steel at $13 a gross ton, delivered, a cut of 25c. below the last large purchase of several weeks ago. Several thousand tons of hydraulic bundles have also been purchased at new low price levels. The entire structure of the scrap market is weak. Railroad shipments are heavy and the supply in all grades is ample for immediate requirements. Following the lower pace in some industries, there is a slackening in the rate of scrap shipments from that source. Buyers of specialties are moving cautiously, taking only small lots for immediate shipment and avoiding piling scrap against future use.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.50 to $13.00
Shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart, and miscellaneous rails	13.50 to 14.00
Hydraulic compressed sheets	11.25 to 11.75
Drop forge flashings	9.50 to 10.00
Forged, cast and rolled steel carwheels	15.50 to 16.00
Railroad tires, charging box size	15.75 to 16.25
Railroad leaf springs, cut apart	15.75 to 16.25
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.00 to 14.50
Coil springs	16.00 to 16.50
Electric Furnace Grades:	
Axle turnings	12.50 to 13.00
Low phosphorus punchings	14.00 to 14.50
Low phosphorus plate, 12 in. and under	14.00 to 14.50
Blast Furnace Grades:	
Axle turnings	9.50 to 10.00
Cast iron borings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
Machine shop turnings	6.75 to 7.25
Rolling Mill Grades:	
Iron rails	14.00 to 14.50
Rerolling rails	14.75 to 15.25
Cupola Grades:	
Steel rails less than 3 ft	15.50 to 16.00
Angle bars, steel	14.25 to 14.75
Cast iron carwheels	13.00 to 13.50
Malleable Grades:	
Railroad	12.50 to 13.00
Agricultural	11.50 to 12.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angles and splice bars	14.00 to 14.50
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	23.00 to 23.50
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.75 to 10.25
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	12.00 to 12.50
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	14.00 to 14.50
No. 1 railroad cast	13.00 to 13.50
No. 1 agricultural cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Grate bars	11.25 to 11.75
Brake shoes	11.00 to 11.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.30c. to 3.00c.
Reinforcing bars, hard steel	2.00c. to 2.70c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.30
Common wire nails, base per keg	3.10
Cement coated nails, base per keg	3.10

Philadelphia

Few Third Quarter Pig Iron or Steel Contracts—Plate Market Active

PHILADELPHIA, June 19.—Specifications against steel contracts are in fair volume, but consumers still show but little interest in third quarter commitments. Mills are not seeking contracts, apparently believing that 1.90c., Pittsburgh, on bars, 2.05c., Coatesville, on plates, and 2.05c., Bethlehem, on shapes, might meet with opposition from buyers. At the same time there is no desire to seek business at the present contract level of $1 a ton less, as buyers might ask for further concessions on new contracts.

Eastern Pennsylvania mills are maintaining a fair rate of operation with an average of 60 to 65 per cent of capacity. Producers of shapes report irregular business and the market continues to show a considerable range of prices. Sheet prices are unstable, sizable tonnages bringing out concessions. Galvanized sheets are generally quoted at 3.55c., Pittsburgh, but 3.50c., Pittsburgh, has become quite common on all but the smallest orders.

Foundry consumers of pig iron are accepting regular shipments against contracts, but evidently intend to cover their future requirements as they arise. Iron and steel scrap prices show further weakness and several grades are off about 50c. a ton.

Pig Iron.—Most of the current buying of foundry iron is limited to 100 and 200 ton lots for shipment early in the coming quarter. The J. L. Mott Iron Works, Trenton, N. J., is asking for 100 tons of foundry grade. The American Engineering Co., Philadelphia, in the market for 500 tons of foundry, has not yet closed. Furnaces are maintaining $20, base, eastern Pennsylvania, except in the case of the usual equalization of freight rates, and there is no evident inclination to recede from this level. Steel foundries are rather inactive and low phosphorus sales in this district seldom total more than a carload. No basic has been closed, but some small buying seems to be expected soon.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26
East. Pa. No. 1X	21.76
Basic (delivered eastern Pa.)	$19.00 to 19.50
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	24.54
Virginia No. 2X, 2.25 to 2.75 sil.	25.04

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Ferromanganese.—Small consumers are still seeking 100 and 200 ton lots for third quarter delivery at $105, seaboard, but the larger users evidently have sizable stocks bought at $100, seaboard, and are in no haste to enter into contracts.

Bars.—Specifications against contracts are good and there is a moderate volume of new business. Some consumers who have been rather steady users of foreign material have returned to the domestic product recently, as imported steel no longer represents much of a saving. Current prices range from 1.85c. to 1.90c., Pittsburgh, or 2.17c. to 2.22c., delivered Philadelphia. No third quarter contracting is reported as yet.

Plates.—Eastern Pennsylvania mills report a sizable tonnage of small orders for immediate requirements and on much of this business 2.05c., Coatesville, or 2.15c., Philadelphia, is the prevailing price. Shipments against second quarter contracts continue satisfactory, but consumers have shown no interest in contracting for the coming quarter. The Pusey & Jones Co., Wilmington, is fairly well occupied with shipbuilding contracts, principally on private yachts. The American Brown Boveri Electric Corporation is reported negotiating for the sale of its shipbuilding business at Camden, N. J. The Baldwin Locomotive Works has booked some new locomotive orders, but is only operating at 15 to 20 per cent of capacity. The Pennsylvania Railroad recently closed on a few hundred tons of plates with a Pittsburgh district mill, part of its third quarter requirements.

Shapes.—The price situation is unchanged, quotations ranging from 2c., Pencoyd, or 2.06c., Philadelphia, to 2c., Bethlehem, or 2.13c., Philadelphia. Fabricated projects are still being placed at low prices and the market shows no tendency toward improvement. About 2700 tons of steel for an apartment building at Rittenhouse Square has been awarded by the United Engineering Co. to the Shoemaker Bridge Co. An outstanding project in this district is the new store for Strawbridge & Clothier, estimated as requiring close to 10,000 tons of steel. The Pennsylvania Railroad has placed a small tonnage of shapes with a Pittsburgh mill, part of its third quarter requirements.

Track Material.—Third quarter requirements of the Pennsylvania Railroad, which included 342,000 track bolts, 1,800,000 lb. of spikes and 330,000 tie plates brought out the following bids on June 15: Standard spikes, 2.80c.; copper bearing, 2.95c.; standard tie plates, $43 per ton, and heavy duty, $51; track bolts, $4.05, all f.o.b. mill. Bids of all of the 12 bidders were uniform except in the case of the Wheeling Steel Corporation, which bid 2.84½c., f.o.b. Portsmouth, Ohio, with 19c. freight allowance on the spikes and $44 per ton, f.o.b. Portsmouth, with $3.80 freight allowance on the tie plates.

Sheets.—Blue annealed are still being maintained at 2.10c., Pittsburgh, for small lots, but 2c., Pittsburgh, or 2.32c., Philadelphia, is rather general. Black sheets are generally quoted at 2.65c., Pittsburgh, or 2.97c., Philadelphia, but concessions of $1 a ton are not uncommon. Galvanized sheets range from 3.50c. to 3.55c., Pittsburgh, or 3.82c. to 3.87c., Philadelphia, and the lower quotations are becoming more common. Sheet consumers are apparently well covered on present requirements and not interested in future contracts.

Warehouse Business.—Orders are small, but in fair volume, and prices are firm, except for a reduction of 15c. per 100 lb. in the prices of black and galvanized sheets, a revision which brings them more in line with the present mill schedule. The quantity bases on black and galvanized sheets continue effective.

Imports.—In the week ended June 16, imports included 6900 tons of Algerian iron ore and a total of 994 tons of pig iron. The pig iron arrivals consisted of 849 tons of Indian, 103 tons of Dutch and 42 tons of Swedish iron. Steel arrivals at this port were as follows: Belgium, 386 tons of structural shapes and 225 tons of steel bars; France, 172 tons of structural shapes and 64 tons of steel blooms; Germany, 313 tons of skelp and 29 tons of steel scrap; Sweden, 69 tons of steel bars, 4 tons of iron bars and 3 tons of steel blooms.

Old Material.—Prices of some grades have again receded and the market as a whole shows no firmness.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, ⅜-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.60c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.35c.
Cold-finished steel, squares and flats	3.85c.
Steel hoops	3.50c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.25c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.85c.
†Galvanized sheets (No. 24)	4.60c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bundles, 4.10c. base; 1 to 9 bundles, 4.35c. base.

†For 50 bundles or more; 10 to 49 bundles, 4.95c. base; 1 to 9 bundles, 5.30c. base.

No. 1 heavy melting steel has not been bought lately by an eastern Pennsylvania mill, but $13.50 per ton seems to be the price idea of both buyers and sellers. Heavy breakable cast is off about 50c. a ton, based on a recent sale of about 3000 tons to a Coatesville consumer at $15 per ton and a smaller tonnage to a Harrisburg consumer at the same price. Yard grade of heavy melting steel has been sold to a Pottsville, Pa., company at $10.50 per ton.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50
Scrap T rails	$13.00 to 13.50
No. 2 heavy melting steel	10.50 to 11.00
No. 1 railroad wrought	13.50 to 14.50
Bundled sheets (for steel works)	10.50
Machine shop turnings (for steel works)	10.50
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	10.50
Heavy breakable cast (for steel works)	15.00 to 15.50
Railroad grate bars	11.00
Stove plate (for steel works)	11.00
No. 1 low phos., heavy, 0.04 per cent and under	17.50 to 18.00
Couplers and knuckles	14.50 to 15.00
Rolled steel wheels	15.00
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	11.00 to 11.25
Wrought iron and soft steel pipes and tubes (new specifications)	12.00 to 12.50
Shafting	17.00 to 17.50
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Cast iron carwheels	15.50 to 16.00
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	14.50 to 15.00
Steel rails for rolling	14.50 to 15.00

New York

Pig Iron Buying Subsided—Steel Specifications Hold Up

NEW YORK, June 19.—Pig iron buying has subsided, and sales in this territory totaled 7000 tons for the week. The price situation shows little change, but, with an increasing amount of business being placed for barge or barge-and-rail shipment, base quotations at furnace are more difficult to ascertain. Barge rates vary; the rate on shipments from Buffalo to New York harbor has recently ranged all the way from $1.50 to $2.50 a ton. Buffalo producers are following a consistent policy of shipping by barge and rail to New Jersey points taking a higher all-rail rate than $3.28 a ton. In many cases the all-rail rate to such destinations is $4.91. That pig iron makers propose to take advantage of the saving by the water route for winter deliveries is indicated by the fact that one Buffalo interest has arranged for storage space at Jersey City, N. J., and two others expect to store iron at Elizabethport, N. J. New England pig iron is also reaching New Jersey by water, several barge loads having recently docked at Jersey City. The American Steel & Wire Co. recently barged 3000 tons of steel-making iron from its Cleveland works to Beacon, N. Y., where it was transferred to cars for Worcester, Mass. In the past few years this company has moved 10,000 to 15,000 tons annually by this route. The General Electric Co. has closed against its inquiry for 2200 tons for Bayway, N. J., Elmira, N. Y., and its New England plants, and has also bought for Erie, Pa. The New York Central Railroad has bought 400 tons of foundry for Frankfort, N. Y., and Elkhart, Ind. The New York Air Brake Co. has placed 200 tons of low phosphorus, a carload of silvery and a tonnage of malleable for its Watertown, N. Y., plant. Silvery iron, in the 10 to 11 per cent grade, is reported to have been sold recently at $29 per ton, Buffalo.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	20.89 to 23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 23.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Finished Steel.—Specifications for rolled steel, while no greater in total volume than obtained in early June, are a source of surprise considering general conditions. There is substantially no change from the situation a week ago. Chief promise at the moment in structural steel lies in further large buying for subway work.

Mill prices per lb., delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; structural shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

Cast Iron Pipe.—Buying is rather well distributed among privately and publicly owned utilities and prices are unchanged. Southern foundries are quoting $32 to $33 per ton, base, Birmingham. Northern makers continue to quote $37.60 to $38.60 per net ton, delivered New York. The Department of Purchase, New York, will open bids June 29 on a tonnage of water pipe,

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars and small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-rolled strip, soft and quarter hard,	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue annealed sheets (No. 10 gage),	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.60c. to 5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap		
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.
No. 22	3.75c. to 3.95c.
No. 24	3.80c. to 4.00c.
No. 26	3.90c. to 4.10c.
No. 28*	4.05c. to 4.25c.
No. 30	4.30c. to 4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.15c. to 4.35c.
No. 16	4.00c. to 4.20c.
No. 18	4.15c. to 4.35c.
No. 20	4.30c. to 4.50c.
No. 22	4.35c. to 4.55c.
No. 24	4.50c. to 4.70c.
No. 26	4.75c. to 4.95c.
No. 28*	5.00c. to 5.20c.
No. 30	5.40c. to 5.60c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

fittings, valves and hydrants. The Power & Light Corporation, Albany, N. Y., has closed on 60,000 ft. of 4 to 16-in. gas pipe. Wethersfield, Conn., has awarded 320 tons of 10-in. water pipe to the American Cast Iron Pipe Co. An inquiry in the market for export calls for 500 tons of water pipe for Hayti.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $37.60 to $38.60; 4-in. and 5-in., $42.60 to $43.60; 3-in., $52.60 to $53.60; Class A and gas pipe, $4 to $5 extra.

Coke.—Although buying of foundry coke is for the most part of carload lots, the total of such business is fairly large. Standard Connellsville foundry coke is quoted at about $3.75 per ton at the ovens and standard foundry at $2.50 to $2.75 per ton, Connellsville. Special brands of foundry grade are at $4.85 per net ton, ovens. By-product coke prices continue unchanged for foundry grade. Delivered prices of special brands of foundry coke are: To northern New Jersey, Jersey City and Newark, $8.56 per net ton; to New York and Brooklyn, $9.44 per net ton. By-product foundry coke contracts are being made for third quarter and second half and no change in price has been announced. Quotations continue at $9 to $9.40 per net ton, Newark or Jersey City, and from $10.06 to $10.29 per net ton, New York or Brooklyn.

Warehouse Business.—Most jobbers in this district report a slight improvement in the number of orders, but purchases are still small. There is a moderate demand for small lots of structural material and galvanized sheets are quite active at 4.50c. to 4.70c. per lb., base. Only small lots of black sheets are being sold at 3.80c. to 4c. per lb., base.

Old Material.—Buying prices of some grades of scrap are off slightly, and others show a tendency to decline. No. 1 heavy melting steel is unchanged at $13 per ton, delivered eastern Pennsylvania. Yard grade has been sold at $10.50 per ton to a consumer at Pottsville, Pa., and some brokers are seeking to buy at $10 per ton, delivered, while others with old contracts are still offering $10.50 per ton. Yard grade is still being shipped to Weirton, W. Va., at $14 per ton, delivered on a $5.30 freight rate. As this is delivered on a No. 1 heavy melting steel contract it is subject to a reduction of $1 to $2 per ton, but still nets the seller as much or more than he would receive on shipment to eastern Pennsylvania. Heavy breakable cast is quoted at $14.50 per ton delivered to Coatesville or Harrisburg, Pa., both consumers having recently bought at $15 per ton.

Dealers' buying prices per gross ton f.o.b. New York:

No. 1 heavy melting steel	$9.50 to $10.35
Heavy melting steel (yard)	6.50 to 7.00
No. 1 heavy breakable cast	11.00 to 12.00
Stove plate (steel works)	7.00 to 7.25
Locomotive grate bars	7.00 to 7.50
Machine shop turnings	6.00 to 6.50
Short shoveling turnings	6.00 to 6.50
Cast borings (blast furnace or steel works)	6.25 to 6.75
Mixed borings and turnings	6.00 to 6.75
Steel car axles	14.50 to 15.00
Iron car axles	23.75 to 24.75
Iron and steel pipe (1 in. dia., not under 2 ft. long)	8.25
Forge fire	6.50 to 6.75
No. 1 railroad wrought	9.50 to 10.00
No. 1 yard wrought, long	8.00 to 8.50
Rails for rolling	10.00 to 10.50
Cast iron carwheels	11.00 to 11.50
Stove plate (foundry)	8.50 to 9.00
Malleable cast (railroad)	10.00
Cast borings (chemical)	10.75 to 11.25

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$14.00 to $15.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.00 to 13.00
No. 2 cast (radiators, cast boilers, etc.)	11.50 to 12.50

An addition of 15 ovens to the by-product coke plant of the Central Alloy Steel Corporation, Massillon, Ohio, will be built by the Koppers Construction Co., Pittsburgh. With the completion of the new ovens the plant will comprise 63 Koppers-Becker ovens.

E. Arthur Tutein, Inc., Boston and New York, broker in pig iron and coke, has closed its Philadelphia office.

Cleveland

Steel Specifications Lighter—Sheets Remain Notably Weak

CLEVELAND, June 19.—The demand for structural steel has slowed down somewhat but is holding up well for June. Specifications are lighter from several of the automobile companies in the Detroit territory, which are curtailing production. This retrenchment accounts in most part for the decreased demand as consuming industries in this territory are keeping up to recent fairly good operations. Forge shops and other makers of automobile parts in this territory have made no curtailment in production. Consumers are still refraining from taking interest in third-quarter contracts. Consequently the price advance to 1.90c., Pittsburgh, on steel bars, plate and structural material remains untested and buyers lack confidence that the advance will hold. Meanwhile Cleveland mills have taken some steel bar business for the third quarter at their current price of 1.85c., Cleveland, although they are not making this an open market quotation. Some business in sheets and strip steel for July shipment was placed by automobile companies in the Detroit territory during the week. These are adhering to the policy they have rather generally followed this year by buying only for a month's requirements. Orders against contracts from consumers in other fields are for small lots. Consumers are taking only what they need and the price advance has not yet had the effect of driving in specifications. Structural inquiry is fair. The Cleveland Union Terminals Co. interests today issued an inquiry for New York Central and Nickel Plate railroad bridge and grade crossing elimination work in Cleveland. This, it is estimated, will require 15,000 to 20,000 tons of structural steel.

Pig Iron.—There is a steady volume of sales of foundry and malleable iron for the third quarter, and orders recently taken include lots running up to 3000 to 4000 tons. Cleveland interests sold 23,000 tons during the week. While buying is well scattered, little third quarter business has as yet come from the automotive industry. Following pressure on local furnaces for lower prices and a weakening in the Valley district, Cleveland prices for local delivery have softened to the extent that foundry and malleable grades are now available at $17.50, or a concession of 50c. a ton. Valley iron at $16.75, furnace, costs the Cleveland consumer $18.51, delivered, or virtually the same as local iron bought at $18, furnace. The local market is inactive, and sellers state that they have as yet made no sales at the reduced price. One producer is still asking $18. The Lake furnace price for outside shipment is unchanged at $16.25 to $17, except in Michigan, where $17.50, furnace, is commonly quoted. While basic iron is untested, producers are making an effort to get the market back on a $16 basis. Shipments are holding up well. While one producer reports some falling off this month, shipments by other furnaces are holding up to the May volume. Another cargo of Cleveland iron was shipped by water to Milwaukee during the week. It is stated that this iron was sold before the recent price reduction in Chicago territory.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.00 to $18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.00 to 18.50
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	$15.35 to 15.50
Standard low phos., Valley furn'ce	26.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—Specifications show a decline, particularly for sheet bars. A local maker is not yet naming prices for the third quarter. The open market quotation for sheet bars, billets and slabs is $33, Cleveland, but some concessions are being made in quoting delivered prices and absorbing freight charges.

Sheets.—There has been a moderate slowing down

in the demand for sheets from the automotive industry. While a few contracts for blue annealed sheets have been taken for the third quarter at 2c., Pittsburgh, most consumers who are buying for future delivery are restricting their purchases to July requirements. The market in this territory is very dull. Prices continue weak but are no worse than they have been except possibly on galvanized sheets, which have been offered at as low as 3.45c., Valley mill. Jobbers are still asking 3.60c., mill, for car lots but are finding it increasingly difficult to get that price. Blue annealed sheets are rather commonly offered at 1.90c., Pittsburgh, although some producers will not shade 2c. Black sheets are holding rather steady at 2.65c., Pittsburgh. Auto body sheets continue to move well and are firm.

Strip Steel.—Some of the mills have arranged with larger consumers to take care of their requirements for the third quarter at the prices that prevailed during the first and present quarters, thus establishing the market at around 1.75c., Pittsburgh, for wide strip. The demand has slackened considerably and quite a number of consumers have enough strip coming on contracts to carry them well into the third quarter. The demand for cold rolled strip has declined. Users are willing to take third-quarter contracts at 2.75c., Cleveland, but consumers are as yet showing no interest in contracts.

Old Material.—The supply of scrap is more plentiful at the quoted prices than recently, and to that extent the market has a weaker tone. No new demand came from the mills during the week, and there is very little buying by dealers. Dealers who recently paid $15.75 for high-grade heavy melting steel for delivery to a Cleveland mill are now able to buy the same grade at $15.50 to $15.60. For other Cleveland mills they are paying $13.25. Blast furnace scrap seems plentiful at $9.25 to $9.35. No. 1 cast scrap on cars is not bringing above $16.50. With no local demand, machine shop turnings have shown a further decline of 50c. a ton.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.00 to $13.25
No. 2 heavy melting steel	12.50 to 12.75
Compressed sheet steel	12.50 to 13.00
Light bundled sheet stampings	11.50 to 11.75
Drop forge flashings	11.50 to 11.75
Machine shop turnings	6.50 to 7.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 13.75
No. 1 busheling	11.00 to 11.25
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	9.25 to 9.50
Mixed borings and short turnings	9.25 to 9.50
No. 2 busheling	9.25 to 9.50
Cupola Grades	
No. 1 cast	16.25 to 16.75
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	16.75 to 17.25
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

Reinforcing Bars.—Contracts for 1700 tons for the Cleveland Union Terminal Co. work, for which the Aronberg Fried Co., New York, has the general contract, was awarded during the week. It is understood that this business as well as some other lots placed recently have been taken at quite a concession from the 1.85c., Cleveland, price. Rail steel bars are unchanged at 1.75c., mill.

Alloy Steel Bars.—With the slowing down of the automotive industry, specifications have declined this month. Most consumers in this territory have placed contracts for the third quarter at the present prices, to which there seems to be very little objection.

Bolts, Nuts and Rivets.—Demand for bolts and nuts continues fair. Rivets are moving somewhat better than last month. Many buyers have placed contracts for the third quarter at the present price, which has been reestablished for that delivery.

Coke.—The foundry coke market is dull, new demand being confined to small lots. Prices are unchanged at $3.50 to $4.85, ovens, for Connellsville foundry coke. Ohio by-product coke is quoted at $7.75, Painesville, for June shipment.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.85
No. 9 galvanized wire, per 100 lb	3.30
Common wire nails, base per keg	2.85

*Net base, including boxing and cutting to length.

Light-Weight Oil-Electric Locomotive in Service

Recently the Long Island Railroad put into service the first light-weight oil-electric switcher locomotive built in the United States. It is capable of producing 600 hp., weighs only 85 tons and burns the cheapest grades of fuel oil. It is said that what a steam engine will do on a ton of coal this new engine will do on 10 gal. of oil.

It has been recognized for some time that the oil engine can produce a given amount of power at a much lower cost than any other type of engine. This locomotive has not only that feature, but it is lighter and speedier than the oil-burning engines which have been in use previously. It operates at 800 r.p.m. maximum, and the weight per brake horsepower is 283½ lb.

The locomotive consists of two cabs normally coupled and operated as a single unit, but capable of individual service if desired. The combined unit, 47 ft. long, is geared for a maximum speed of 34 miles an hour, though speeds of more than 80 miles an hour can be secured with this type of motive power in passenger locomotives.

Each cab contains a 300-hp., six-cylinder oil engine, and each engine drives a 210-kw. electric generator, which furnishes power to two traction motors. The generator supplies direct current at 750 volts when operated at normal high speed. It not only supplies power for the traction motors, but also starts the oil engine, receiving 64-volt power from a storage battery, and charges the battery while idling.

The locomotive also solves one of the most difficult problems of oil-electric design, that of stalling when the demands upon the engine are too sudden. The use of a variable-speed governor and development of what is known as automatic torque-governor control permit all the power developed by the engine to be applied at all times, even when starting or pulling heavy loads at slow speeds. The engine and electric equipment were built by the Westinghouse Electric & Mfg. Co. and the mechanical parts were supplied by the Baldwin Locomotive Co.

C. O. Bartlett & Snow Co., Cleveland, manufacturer of conveying equipment, has opened a branch office at 505 First National Bank Building, Chicago, in charge of S. G. Artingstall, Jr., formerly chief engineer J. C. Buckbee Co., Chicago; vice-president and chief engineer United Engineering Co., and later district manager for the Stearns Conveyor Co., Cleveland.

Employment in May showed a 2 per cent gain over April, according to the Monthly Labor Barometer of the National Metal Trades Association, Chicago. This was in contrast with a drop of 3 per cent between April and May, 1927. Employees reported for May are given as 646,202, against 591,353 from the same establishments a year ago.

San Francisco

Heavy Awards of Cast Pipe—1144 Tons of Line Pipe Placed in East

SAN FRANCISCO, June 16 (*By Air Mail*).—Hand-to-mouth buying continues to prevail in the iron and steel markets on the Pacific Coast, and bookings this week were by no means heavy. Outstanding among the developments of the week were the placing of a carfloat by the Western Pacific Railroad in San Francisco, requiring 525 tons of plates and 275 tons of shapes, with the Moore Drydock Co. and the booking by the United States Cast Iron Pipe & Foundry Co. of 1800 tons of cast iron pipe for a sewer project in Los Angeles and 1044 tons for the city of Tacoma, Wash.

Building operations in the Los Angeles district continue on a par with activity last year. Up to and including June 6, permits issued numbered 688 with an estimated valuation of $2,747,245, compared with 664 permits and a valuation of $1,932,298 for the corresponding period in June, 1927. Total permits issued so far this year are approximately $5,000,000 behind the corresponding total last year, the total this year being $45,559,381, compared with $50,770,100 for 1927.

Pig Iron.—Little improvement is noted in the rate of foundry operations, and sales and inquiries are confined to small tonnages. No change in quotations has occurred.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Most reinforcing steel bar awards continue to consist of lots ranging from 20 to 40 and 50 tons. Larger awards include 150 tons for a cement plant at Seattle, Wash., taken by the Pacific Coast Steel Co., and 147 tons for a viaduct at Mount Vernon, Wash., booked by the Northwest Steel Rolling Mills. Bids were opened this week on 120 tons for the Cahe Creek bridge at Sacramento, Cal., and bids will be opened on July 5 for 400 tons for paving in Ventura County, California. Out-of-stock prices in the bay district have not improved and 1.80c. to 2c. is still the range. Demand for merchant bar material is not heavy, and most orders coming to hand call for carload lots comprising numerous sizes.

Plates.—Only one project of importance was reported this week. This was a carfloat for the Western Pacific Railroad, requiring 525 tons. Bids have been opened on a carfloat for the Santa Fe Railroad at San Francisco, calling for 525 tons of plates and 275 tons of shapes, the Moore Drydock Co. being low bidder. Demand for oil storage tanks and riveted-plate pipe lines is nil, and little contemplated tonnage is in sight. Quotations cannot be considered firm and range from 2.20c. to 2.30c., depending upon the desirability of the specification.

Shapes.—Structural shape awards fell off from the total of the previous week, less than 2600 tons being reported placed. Included among the lettings was 900 tons for a headframe for a mine in Nevada, booked by the Kansas City Structural Steel Co. New inquiries include 1500 tons for the Medico-Dental Building, Spokane, Wash. Plain material remains firm at 2.35c., c.i.f. Coast ports.

Cast Iron Pipe.—Pipe awards were the heaviest in over eight weeks and aggregated 2956 tons. An unnamed interest took 113 tons of 4 to 8-in. Class B pipe for Vancouver, B. C. The United States Cast Iron Pipe & Foundry Co. secured 1799 tons of 30 and 36-in. Class B pipe for the Venice outfall sewer at Los Angeles and 1044 tons of 8 to 24-in. Class C pipe for Tacoma, Wash. Pending business is of limited proportions, less than 800 tons being up for figures. The only new inquiry of the week is 300 tons of 4 to 10-in. Class B pipe for Burbank, Cal.

Steel Pipe.—Movement of standard tubular products and oil country goods during the past two or three months has been limited, and the market is quieter than it has been in years. The Smith-Booth-Usher Co. took 193 tons of ½ to 4-in. standard pipe for the city of Los Angeles. The Southern California Gas Co. has placed 1144 tons of 12-in. line pipe with an unnamed Eastern mill, the contract for the installation of the pipe going to the Virginia Pipe Line Contracting Co.

Coke.—Demand for foundry coke is limited and reflects the quiet condition noted in the pig iron market. A shipment of 4500 tons of English beehive and by-product coke is due to arrive early next month.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.95c.
Blue annealed sheets (No. 10)	3.90c.
Galvanized sheets (No. 24)	5.50c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.40
Cement coated nails, 100-lb. keg	3.40

St. Louis

Pig Iron Buying Conservative—Plate Mill Running Full

ST. LOUIS, June 19.—Melters seem to lack confidence in the pig iron market and are buying in the smallest possible quantities. Carload orders were the rule during the last week. Of 1200 tons of foundry grades sold by the St. Louis Coke & Gas Corporation, the largest order was 500 tons. One company that ordinarily buys 1000 tons at a time placed an order for a carload. There is much pig iron to be purchased for third quarter consumption, and it is expected that demand will be more active soon. The Granite City company has blown out the older of its two furnaces for relining.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.00
Northern No. 2 fdy., delivered St. Louis	20.16
Southern No. 2 fdy., delivered	$19.92 to 20.42
Northern malleable, delivered	20.16
Northern basic, delivered	20.16

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Domestic grades are fairly active among dealers. Buying of foundry coke is light, following a lessening of the melt in the district.

Finished Steel.—Following the establishment of lower prices on sheets, the Granite City Steel Co. reports an improvement in demand, especially for galvanized sheets, and has found it necessary to put on another galvanizing pot. This mill continues to experience a fair demand for black sheets and blue annealed sheets, and business in plates is sufficient to permit 100 per cent operations in its plate department. Railroad buying is light. A building for the American Railway Express Co., St. Louis, requiring 1000 tons, is the only structural project of note pending.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets (No. 24)	4.50c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	70
Less than 100 lb.	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, squares, blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Old Material.—What little life there was in the market during the past week was accounted for by purchases of miscellaneous rails by a district mill at $13 per ton. The orders, estimated as totaling 3000 tons, were distributed among several dealers, and call for delivery through the next 60 days. Iron car axles, which are scarce, have advanced, now ranging from $25 to $25.50. Stove plate has declined 25c. Railroad lists include Rock Island, 5500 tons; Chicago, Milwaukee, St. Paul & Pacific, 2550 tons; Gulf Coast Lines, 1450 tons; Texas & Pacific, 1000 tons; Missouri-Kansas-Texas, 500 tons of 60-lb. relaying rails.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

Heavy melting steel	$11.00 to $11.50
No. 1 locomotive tires	12.00 to 12.50
Heavy shoveling steel	11.00 to 11.50
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.25 to 12.75
Railroad springs	13.50 to 14.00
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	11.25 to 11.75
No. 1 busheling	9.75 to 10.25
Cast iron borings	9.00 to 9.50
Iron rails	13.00 to 13.50
Rails for rolling	13.00 to 13.50
Machine shop turnings	7.00 to 7.50
Steel car axles	17.50 to 18.00
Iron car axles	25.00 to 25.50
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	10.00 to 10.50
Steel rails, less than 3 ft	15.00 to 15.50
Steel angle bars	12.00 to 12.50
Cast iron carwheels	13.25 to 13.75
No. 1 machinery cast	13.00 to 13.50
Railroad malleable	11.50 to 12.00
No. 1 railroad cast	13.00 to 13.50
Stove plate	11.00 to 11.50
Agricultural malleable	12.00 to 12.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Birmingham

Seasonal Drop in Steel Demand Smaller Than Usual—Stack to Be Lighted

BIRMINGHAM, June 19.—Producers of pig iron have not yet opened their books for third quarter. Some consumers are extending present arrangements to fill out the quarter, all orders being in small lots. Only a small part of present bookings will extend into July. Shipments continue active and ahead of output. Quotations on No. 2 foundry remain on a $16 base. The Tennessee company plans to blow in one of its two new furnaces at Fairfield, Ala., this week. The other is to be blown in a little later. Each has a daily capacity of 600 tons. At present, furnace operations in the district are the same as for the past three weeks. Eighteen stacks are in blast, which includes 10 on foundry, six on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil	$16.00
No. 1 foundry, 2.25 to 2.75 sil	16.50
Basic	15.00 to 16.00

Finished Steel.—New business continues to develop at an even rate. The recession toward a dull July is less pronounced than for several years. Forward bookings are in good volume. It is understood that one of the larger companies has placed a portion of its plant on double time. Quotations are unchanged, and some concessions are still being made from time to time. Demand for structural steel is below normal, and new business is light. Bar manufacturers are doing a fair amount of current business in small-lot orders of 15 to 75 tons. The Tennessee company is now operating seven open-hearth furnaces at Ensley, Ala., instead of six. Five are being worked at Fairfield, and the Gulf States Steel Co. continues to run four at Alabama City, Ala.

Cast Iron Pipe.—Demand has dropped slightly from the level of the past few weeks. There is little municipal business and no new projects of consequence have developed lately. The market is receiving its support from private lettings in small lots and, as a whole, is duller than at this time last year. Prices remain at $32 to $33 per net ton, Birmingham, for 6-in. and larger. Shipments have been large for several weeks, and unfilled tonnage is being reduced steadily.

Coke.—Foundry coke demand has declined. Foundries are reducing inventories for the end of the fiscal year. Shipments on contracts are off a little. Prices are unchanged, the quotations being $5 per net ton, Birmingham, for both spot and contract business.

Old Material.—Outside of a few inquiries for No. 1 cast and No. 1 railroad wrought, there is no interest in the market. Sales are the smallest in the past year or so. Quotations are unchanged, the market being too weak to afford any test of prices.

Prices per gross ton delivered Birmingham district consumers' yards:

Heavy melting steel	$8.50 to $9.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	7.50 to 8.00
Cast iron borings	8.00
Stove plate	13.50
Steel axles	19.00 to 20.00
Iron axles	20.00 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	13.00
No. 1 cast	14.25
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

Canada

Steel Business 10 Per Cent Ahead of Last Year—Scrap Prices Weaker

TORONTO, ONT., June 19.—Improvement in output and in business continues to feature activities in the iron and steel industry of this country. The betterment so far this year is slightly more than 10 per cent, compared with a year ago.

The value of iron and steel and their products manufactured in Canada during 1927 was $515,971,445, an increase of $10,782,596 over the previous year, at $505,188,849, according to a recent statement by the Dominion Bureau of Statistics. The value for 1927 was the highest since 1920.

Pig Iron.—Increased interest in this market is gradually making itself felt, especially with regard to the placing of advance delivery contracts. With only a few days to go before the beginning of third quarter, melters are inquiring for foundry and malleable iron to take care of needs for that period. Among contracts already closed are several for 1000 tons and a few of 500 tons for delivery during the second quarter. In a normal year the consumption of foundry and malleable pig iron in this country is distributed as follows: Ontario, 175,000 tons; Quebec, 50,000 tons; Nova Scotia, 10,000 tons; New Brunswick, 4000 tons; the other five Provinces, 5000 tons collectively. Except for the introduction of a spread of 50c. a ton on basic iron, prices are unchanged for the week.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.10 to $23.60
No. 2 foundry, sil. 1.75 to 2.25	23.10 to 23.60
Malleable	23.10 to 23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	24.50 to 25.00
No. 2 foundry, sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	23.50 to 24.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Structural Steel.—The strike among structural steel workers in the Toronto and Montreal districts continues to retard building operations, but at the moment it appears that a settlement will shortly be brought about. The strike has not only affected sales for the past month but has also held up deliveries on a number of large structures. Building programs continue to be announced and those in prospect now involve approximately 25,000 tons of steel. Approximately 3000 tons of reinforcing bars will be required for a proposed 12-story structure in Toronto for Wellington Buildings, Ltd.; 3000 tons of structural steel and 1000 tons reinforcing bars are called for in a storage warehouse at Montreal, for which Perrault & Gadbois, Themis Building, are preparing plans; 1000 tons of structural steel will be required for a rink and exhibition building at Moncton, N. B., for the Moncton Exhibition Co.; 4000 tons of reinforcing bars are specified in a medicinal and dental block for Baker, Stevens & Co. at Vancouver, B. C.

Old Material.—Improvement in demand features the market. While some inquiry for third quarter is coming out, no large contracts have yet been placed, and the greater part of current business is for spot delivery. Montreal dealers have made a general revision in prices. Wrought iron and steel axles are being purchased at $1 a ton higher, and standard carwheels have advanced $1.50 per ton. With these exceptions, the Montreal market is weaker. Heavy melting steel, formerly purchased by dealers at $8, is down to $7; turnings have been reduced from $6 to $5, and other grades have declined $1 to $1.50 per gross ton. While Toronto prices remain unchanged, a spread of 50c. a ton has been introduced by local dealers in their purchases, the change being 50c. per ton under previous quotations on all grades.

Dealers' buying prices:

Per Gross Ton

	Toronto	Montreal
Heavy melting steel	$9.00	$7.00
Rails, scrap	10.00	9.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	5.00
Boiler plate	7.00	6.00
Heavy axle turnings	7.50	6.50
Cast borings	7.50	5.00
Steel turnings	7.00	5.50
Wrought pipe	5.00	5.00
Steel axles	14.00	20.00
Axles wrought iron	16.00	22.00
No. 1 machinery cast	....	16.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00

Per Net Ton

No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Boston

Pig Iron Sales Lighter Than in May—Foundry Melt Receding

BOSTON, June 19.—Pig iron sales in New England in the first half of this month fell considerably short of those for the corresponding half of May. Those for the past week approximated 4500 tons, practically all for third quarter and largely for delivery from Buffalo, eastern New York and New England furnaces, with the major portion of the business going to the Mystic company. Included in the transactions was a small tonnage of Indian No. 2X iron at $21.75 a ton on dock here, duty paid, or $23.75 a ton, delivered, and odd lots of western Pennsylvania and Alabama irons at premiums over New York and New England brands. An unconfirmed report is that a Buffalo stack recently offered No. 2X iron at less than $16 a ton, furnace, to meet competition from Eastern producers. The Springfield Foundry Co., Springfield, Mass., is in the market for 100 tons of No. 1X iron for July delivery—the only new open inquiry. Several foundries, however, are privately negotiating for 500 tons to 600 tons for third and fourth quarter delivery, but give no intimation when purchases will be made.

Prices of foundry iron per gross ton delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.91
Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Virginia, sil. 1.75 to 2.25	25.71
Virginia, sil. 2.25 to 2.75	26.21
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Coke.—The outstanding feature of the situation in by-product foundry coke is continued activity in domestic sizes. Dealers are buying more heavily, and there is every indication 1928 will be a record-breaking year. Unquestionably, there is increasing public interest in coke and a decreasing use of anthracite coal. Specifications against foundry coke contracts are easing off, due to a seasonal letdown in the foundry melt of iron. Shipments are still being made at $11 a ton, delivered, within a $3.10 freight rate zone.

Shapes and Plates.—Some recession in contracting for third quarter is reported by mill representatives. Most mills are protecting preferred customers on tonnages, and the 1.90c. per lb., base Pittsburgh, is not obtained as often as 1.85c.

Bars.—Domestic steel bars continue in fairly good demand for third quarter, and there is a fair volume of spot business from small users. The general asking price is 1.90c. per lb., base Pittsburgh, but it is being shaded when competition is keen. Price stability is lacking on reinforcing bars, so far as local distributers are concerned, owing to offerings of imported stock at materially lower prices. An order at 2.40c. per lb., base, from stock is rare.

Fabricating Work.—As anticipated, most of the closed shops during the past week signed up with iron workers for $1.37½ per hour, contrasted with $1.25, heretofore. Now that the labor situation is clearer, steel fabricating jobs that were held back are beginning to come out. The first to appear have been small, yet numerous. Round tonnages are expected shortly, although common opinion is that big work is over temporarily for Greater Boston, at least. Despite the advance in wages, competition among fabricators is keen and low prices were quoted in the past week. In this connection, it should be noted that practically all of the bridge fabricators and many of the large ones specializing on other work are operated on the open shop basis.

Warehouse Business.—Business holds up rather well, but without an increase in the average size of orders. Foreign material is still a factor in this market, although less so than in January or February; yet, when prices are cut, it usually is on imported stock. The steadiness of domestic mill prices tends to stabilize stock prices; yet here and there a shading of list prices is reported by warehouses, when the tonnage is attractive or payment is prompt. Talk of an advance in wire nails appears to have disappeared.

Old Material.—The market is quiet, with the tendency of prices downward. Exports from Boston have been held up temporarily, owing to a lack of steamer space, and there is an accumulation of material on dock. Additional purchases of No. 1 steel are being made at $9 and $9.25 a ton, on dock, however, and of yard steel at $8.50 to $8.75, these prices being a shade easier. The market for yard steel for Pennsylvania delivery is decidedly soft, prices being 50c. to $1 a ton lower than a fortnight ago. This grade is selling at $5.50 to $5.85 a ton, on cars, shipping point. No. 2 steel, commonly shipped as yard steel, is around $7.30. The top price on heavy melting steel is $8.50 a ton on cars, shipping point, a decline of 50c. from last week. A Worcester, Mass., consumer is buying skeleton at $9 to $9.50 a ton, delivered, for which dealers are paying around $7 to $7.25, on cars, shipping point. In contrast

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, round	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

with the general market, chemical borings are more active, owing to freer shipments to New Jersey.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.00 to $8.50
Scrap T rails	8.00 to 8.50
Scrap girder rails	7.50 to 8.00
No. 1 railroad wrought	9.00 to 9.50
No. 1 yard wrought	7.00 to 7.50
Machine shop turnings	5.50 to 5.75
Cast iron borings (steel works and rolling mill)	5.50 to 5.75
Bundled skeleton, long	7.00 to 7.25
Forge flashings	6.50 to 7.00
Blast furnace borings and turnings	5.50 to 5.75
Forge scrap	6.00 to 6.25
Shafting	13.50 to 14.00
Steel car axles	14.50 to 15.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	7.00 to 7.50
Rails for rolling	9.50 to 10.00
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton delivered consumers' yards:

Textile cast	$13.25 to $13.50
No. 1 machinery cast	14.00 to 14.50
No. 2 machinery cast	12.50 to 13.50
Stove plate	10.00 to 10.50
Railroad, malleable	13.50 to 14.50

Detroit

Impressive Gain in Automobile Output—Record Volume of Building Contracts

DETROIT, June 19.—On the basis of figures of June 2, which covered only five of the automobile companies in this territory, it was shown that May production exceeded that for April by approximately 5 per cent. At that time it was expected that when all the figures were available a gain of at least 5 per cent would be shown for the entire group. This proved to have been quite conservative.

With figures now available for 12 motor car builders, including the Cadillac, Chevrolet, Dodge, Ford, Graham-Paige, Hudson-Essex, Hupp, Oakland-Pontiac, Olds, Packard, Reo and Studebaker companies, total production for May is shown to have been 325,055 units, against 298,283 for April, a gain of 26,772 units, or 9 per cent.

Eliminating those companies which did not show representative figures in 1927, May output this year made a gain of 43,595 units, or 23 per cent, over that of May, 1927.

The Cadillac and LaSalle units turned out in May, 1928, totaled 3772. This, incidentally, was the largest May production in the history of the Cadillac Motor Car Co., and, while retail deliveries for last month are not completely reported as yet, they are expected to run between 4500 and 4800—also a new record.

The Chevrolet Motor Co. set a new record for May, with production of 140,700 units, compared with 135,832 in April and 115,600 in May of last year. Output for the first five months of this year totaled 651,000 units, against 513,000 in 1927.

Production by Dodge Brothers, Inc., for the first five months of this year was 102,560 units—that for the same period of 1927, 83,781 units.

Output by the Ford Motor Co. in May was approximately 50,000 units, or 20,000 ahead of the month previous. Local plants of the Ford Motor Co. added 893 employees in the past week, bringing the total to 116,324, which sets a new high record and may be compared with 110,000 employees at peak production of Model T cars in 1926 and with 52,000 employees at the low point in the summer of 1927.

The Graham Paige Motors Corporation shipped its 30,000th car June 1, following a production of 8509 units in May. Output so far this year has been 2.8 times the total for the same period of last year and 8035 units in excess of the entire 1927 production.

The Oakland Motor Car Co., Pontiac, Mich., turned out 25,674 units last month, an increase of 265 over May of 1927, but a decrease of 1387 units from April of this year. The Oakland-Pontiac plant is one of the three organizations that showed a decline in May from the production of April, the other two being the Dodge and Studebaker companies. The Olds Motor Works, Lansing, Mich., produced 11,716 units in May, compared with 3485 for the same month in 1927 and 11,089 units in April of the current year. The Studebaker Corporation, South Bend, Ind., produced only 13,253 units in May, against 14,500 during the previous month and 11,902 units in May, 1927. May output of the Willys-Overland Co., Toledo, Ohio, was 44,559 units, compared with 27,564 for the same month in 1927.

The report of the Employers Association of Detroit shows still another increase in Detroit employment—a gain of 3138—bringing the total to 263,470. These figures cover the payrolls of companies whose employees constitute about two-thirds of the city's working population. The corresponding figure of 1927 was 204,966 persons, or 58,504 less than the present time.

May building contracts in Detroit amounted to $15,639,000, the highest May figure ever recorded. This is 20 per cent above the figure for April of this year and 24 per cent above that for May of 1927.

In the steel market, mill prices on automobile body sheets remain at 4c., Pittsburgh, and on blue annealed sheets at 2c., Pittsburgh. Cold-finished bars are bringing 2.20c., Pittsburgh. Hot-rolled strips, 3 in. and narrower, range from 2.20c. to 2.30c., Pittsburgh; hot-rolled strips, 3 to 6 in. wide, from 1.85c. to 2.10c., Pittsburgh, and 6 in. and wider strip, 1.75c. to 1.90c., Pittsburgh. Structural bars, plates and shapes remain at 1.85c. to 1.90c., Pittsburgh.

Prices on some grades of old material in this district registered further declines during the week, notably long turnings, which recorded a drop of 75c. per ton and flashings 25c. per ton. The market generally shows no sign of strength. The few sales recorded are made near the low of the range.

Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$11.00 to $11.50
Borings and short turnings	7.00 to 7.50
Long turnings	5.75 to 6.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.00 to 20.50
Hydraulic compressed sheets	9.75 to 10.25
Stove plate	11.00 to 12.00
No. 1 busheling	8.50 to 9.00
Sheet clippings	6.00 to 6.50
Flashings	9.00 to 9.50

Cincinnati

Southern Ohio Pig Iron Sells $1 Off—Little Forward Steel Buying

CINCINNATI, June 19.—Dullness continues in pig iron and indications are that the market will be quiet during the remainder of the month. The largest sale in the past week was 300 tons of malleable for a Chattanooga foundry. With the exception of an inquiry for 474 tons of foundry iron for the Louisville & Nashville, pending business consists of lots ranging from single carloads up to 200 tons. Prices reflect the unsatisfactory situation in which producers have been placed. Northern Ohio interests are reported to be booking orders at as low as $16.25, base furnace, whereas Southern makers are moving little iron into the territory north of the Ohio River at $16, base Birmingham. At least one furnace at Ironton is understood to be liquidating the stock on its yards by accepting $1 a ton less than the nominal schedule of $19, base furnace, which has prevailed in recent weeks. There has been no

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforcing bars	3.15c.
Rail steel reinforcing bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

change in Jackson County silvery iron, which is steady at $25, base Jackson, for 8 per cent.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89 to $20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	19.69
Alabama fdy., sil. 2.25 to 2.75	20.19
Tennessee fdy., sil. 1.75 to 2.25	19.69
Southern Ohio silvery 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Reinforcing Bars.—New billet bars continue to bring 1.85c., base Pittsburgh, and rail steel stock 1.80c., base mill.

Warehouse Business.—Shipments out of local warehouses have increased in the past week, and sales in the first half of June showed an improvement of 5 to 10 per cent over the same period in May. Cold-rolled steel bars and strip steel have been especially active, while the demand for wire products has been fair. Structural steel and reinforcing bars are moving in moderate volume. Prices are firm and unchanged.

Coke.—Shipments of by-product foundry coke are running about 10 per cent behind those in May, but domestic grades, on the other hand, are in slightly better demand. An order for 1000 tons of beehive foundry coke for a nearby consumer was the largest transaction of the week. By-product foundry coke at Detroit is reported to have been cut 50c. to $1 a ton, effective June 11, and the market at that point is very soft because of the determination of sellers to secure current business by making substantial concessions to buyers.

Foundry coke prices per net ton delivered Cincinnati: By-product coke, $9.02; Wise County coke, $7.09 to $7.59; New River coke, $9.09 to $9.59. Freight rates, $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Consumers are showing slight interest. Steel plants are not contracting for future requirements, while foundries are making only small miscellaneous purchases. A company in this district bought 1000 tons of No. 2 busheling the past week. Despite the apparent indifference on the part of users, dealers paid approximately the same prices for scrap offered by railroads this month as in May. With the exception of No. 2 busheling, which is off $1 a ton, quotations are unchanged.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$10.75 to $11.25
Scrap rails for melting	11.25 to 11.75
Loose sheet clippings	8.25 to 8.75
Bundled sheets	9.25 to 9.75
Cast iron borings	7.75 to 8.25
Machine shop turnings	7.25 to 7.75
No. 1 busheling	10.00 to 10.50
No. 2 busheling	6.00 to 6.50
Rails for rolling	12.50 to 13.00
No. 1 locomotive tires	12.75 to 13.25
No. 1 railroad wrought	10.00 to 10.50
Short rails	15.75 to 16.25
Cast iron carwheels	12.25 to 12.75
No. 1 machinery cast	15.25 to 15.75
No. 1 railroad cast	12.75 to 13.25
Burnt cast	7.50 to 8.00
Stove plate	8.25 to 8.75
Brake shoes	9.50 to 10.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	11.00 to 11.50

Finished Material.—A fair volume of steel has been ordered by buyers in the past week, although considerable hesitancy in making forward purchases is discernible among large consumers. The advance of $1 a ton in bars, structural shapes and plates has not had the desired effect of forcing in specifications against current contracts, and many users are not yet convinced that the new price of 1.90c., base Pittsburgh, will be sustained under a real test. There has been a slight upward turn in structural steel demand, but major projects are still scarce and fabricators are obliged to take numerous small jobs to keep their shops busy. Gas holder builders are operating their plants at about a normal rate, although work ahead must be augmented soon in order to insure the maintenance of present production levels. Conditions in the sheet market continue to reflect the flexibility of prices. For blue annealed stock the average quotation is 2c., base Pittsburgh, while galvanized sheets range from 3.50c. to 3.60c. Black sheets are selling at 2.65c. to 2.80c. District mills declare that the cold weather in the past month has retarded the usual buying movement in light-gage galvanized sheets for roofing purposes, particularly in the South. Unless there are unexpected developments, however, this business will be placed during the remainder of June and in July. Demand for common wire nails and for plain wire is sagging somewhat, with the former bringing $2.50 per keg, base Ironton, and the latter $2.40 per 100 lb., base Ironton. An exception is made in the case of spring wire, which is moving briskly. Cold-rolled bars and strip steel are more active than a few weeks ago.

Buffalo

Some Activity in Pig Iron—Black Sheets and Scrap Softer

BUFFALO, June 19.—Business has been good, with quite a bit of inquiry and considerable placing. The General Electric Co. has purchased, it is reported, about 6000 tons in all for its various plants, with considerable of this iron business coming to Buffalo. Two inquiries for foundry and malleable of 2000 tons apiece came out and one of these has been placed with a Buffalo furnace.. Another inquiry in the East was for 1000 tons of foundry. The International Harvester Co. is seeking to buy foundry and malleable for its Auburn plant, with probable requirements of 500 to 1000 tons. The New York Central is reported to have placed 450 tons of foundry for the third quarter, and a Fitchburg, Mass., melter bought 100 tons. Another lot of 200 to 300 tons was placed in New England. An Erie, Pa., inquiry is for 500 tons of foundry. The Lackawanna Railroad will purchase for Scranton, Pa. A considerable volume of iron has been sold in small lots. The price in the district is holding firmly to $17, Buffalo, for No. 2 plain and $17.50 for malleable. Canal shipment iron for the East has figured back generally to about $16.50, Buffalo.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2 foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	$16.50 to 17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Demand is fair. A local structural fabricator took 1000 tons for the new Riverside high school, and the New York Central has placed 600 tons of reinforcing steel for its track canopy and foundations at the new Buffalo terminal. Mill operations are being maintained, with prices of bars, shapes and plates unchanged. The black sheet price is reported softer.

Old Material.—Buying conditions have been very quiet though shipments to consumers have been heavy. An occasional sale of No. 1 machinery cast scrap and malleable at prices quoted is noted.

Prices per gross ton, f.o b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.25 to $14.50
No. 2 heavy melting steel	12.50 to 13.00
Scrap rails	13.50 to 14.00
Hydraulic compressed sheets	12.50 to 13.00
Hand bundled sheets	8.50 to 9.00
Drop forge flashings	12.00 to 12.50
No. 1 busheling	12.50 to 13.00
Heavy steel axle turnings	12.00 to 12.50
Machine shop turnings	7.75 to 8.25
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.00
Railroad coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.00
Low phosphorus billet and bloom ends	16.00 to 16.50
Electric Furnace Grades	
Heavy steel axle turnings	12.00 to 12.50
Short shoveling steel turnings	10.00 to 10.50
Blast Furnace Grades	
Short shoveling steel turnings	10.00 to 10.50
Short mixed borings and turnings	9.50 to 10.00
Cast iron borings	9.50 to 10.00
No. 2 busheling	9.00 to 9.25
Rolling Mill Grades	
Steel car axles	15.50 to 16.00
Iron axles	20.00 to 20.50
No. 1 railroad wrought	12.00 to 12.50
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	13.00 to 13.25
Locomotive grate bars	11.50 to 12.00
Steel rails, 3 ft. and under	16.50
Cast iron carwheels	12.00 to 12.50
Malleable Grades	
Industrial	15.00
Railroad	15.00
Agricultural	15.00

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	June 19	June 18	June 16	June 15	June 14	June 13
Lake copper, New York	14.87½	14.87½	14.87½	14.87½	14.87½	14.87½
Electrolytic copper, N. Y.*	14.50	14.50	14.50	14.50	14.50	14.50
Straits tin, spot, N. Y.	46.62½	47.50	....	48.75	48.37½	48.25
Lead, New York	6.30	6.30	6.30	6.30	6.30	6.30
Lead, St. Louis	6.15	6.15	6.15	6.15	6.15	6.15
Zinc, New York	6.50	6.50	6.50	6.50	6.50	6.50
Zinc, St. Louis	6.15	6.15	6.15	6.15	6.15	6.15

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, June 19.—Quotations for the major metals are all very firm except that for tin, which has sunk to new low levels of nearly four years. All the markets are only moderately active, buying of tin being possibly the heaviest.

Copper.—Statistics for May, which appeared early last week, are considered favorable by producers. They show a decrease of about 6000 tons in refined stocks and an increase of about the same amount in blister copper, one offsetting the other. Output at the mines showed an increase, which is considered favorable because more metal is needed in the near future. Very little change is noted in the general market. Demand from foreign countries continues the feature, total sales thus far this month being estimated at around 45,000 net tons. This is nearly on a par with the buying in May, which was of record proportions. Germany easily leads, her total purchases being about double those of either England or France. Prices are unchanged, the quotation for Copper Exporters, Inc., being 15c., c.i.f. European ports. Demand from domestic consumers is light, most of them being well covered for July and a large part of August. Small lots of July electrolytic copper have sold at a slight premium and there has been some buying of September metal. Lake copper is quiet but very firm at 14.87½c., delivered.

Tin.—Sales for the week ended Saturday, June 16, were about 1100 to 1200 tons, taken mostly by dealers. Consumers have not been active in many weeks and this holding back, combined with liberal sales of the metal in the Far East, has caused market values to fall away to new low levels in the last two or three weeks. Spot Straits tin today was quoted at 46.62½c., New York, which is the lowest price since Sept. 24, 1924, when it was 47c. London prices have also taken a sharp downward turn in the week of nearly £10 per ton. Spot standard today was quoted at £213 10s., future standard at £210 15s. and spot Straits at £214 10s. per ton. The Singapore price today was £215 5s. Sentiment in New York and London was very blue today and bulls in London have become disheartened and are throwing over the metal. European consumers are also holding back, thus increasing the backlogs of possible demand later. Arrivals thus far this month have been 3945 tons, with 5375 tons reported afloat.

Lead.—The market is without feature and practically unchanged, the quotation of the leading interest still standing at 6.30c., New York, with the outside market firm at 6.15c., St. Louis. These quotations apply to spot and June, but a small premium is asked for deliveries beyond June. The market is not active, sales being confined to carload and small lots.

Zinc.—The chief interest is in the ore situation, which has changed but little. Sales at Joplin on Saturday were about 9000 tons at $40 to $41. The production of ore was about 11,000 tons. Quotations for prime Western are strong at 6.15c., East St. Louis, or 6.50c., New York, with practically no metal for sale at lower levels. Buying is not heavy, but is of fair proportions and is confined to nearby delivery. Very little July metal is being sold, quotations in most cases being 6.20c., East St. Louis.

Nickel.—Wholesale lots of ingot nickel are quoted unchanged at 35c., shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Antimony.—Chinese metal is available for all positions at 9.50c. to 9.75c., New York, duty paid.

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	50.00c. to 51.00c.
Tin, bar	52.00c. to 53.00c.
Copper, Lake	15.75c.
Copper, electrolytic	15.50c.
Copper, castings	14.75c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	7.25c. to 7.75c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	12.00c. to 12.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99 per cent pure)	25.00c. to 26.00c.
Aluminum ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	32.00c. to 33.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	54.00c.
Tin, bar	58.00c.
Copper, Lake	14.85c.
Copper, electrolytic	14.85c.
Copper, casting	14.00c.
Zinc, slab	7.75c.
Lead, American pig	7.10c.
Antimony, Asiatic	16.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	57.50c.
Solder, ½ and ½	31.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	19.25c.
Copper, hot rolled	24.00c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Seamless Tubes—	
Brass	24.12½c.
Copper	25.00c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open	11.00c. to 11.50c.

Non-Ferrous Rolled Products

Prices of all non-ferrous products continue unchanged, the present bases having been established May 25 on brass and copper, May 29 on full lead sheets and June 7 on zinc sheets.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.25c.
Copper, hot rolled	23.50c.
Zinc	9.25c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	24.12½c.
Copper	25.00c.
Rods—	
High brass	17.00c.
Naval brass	19.75c.
Wire—	
Copper	16.75c.
High brass	19.75c.
Copper in Rolls	22.50c.
Brazed Brass Tubing	27.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	23.50c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.62½c.
Copper	26.50c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, June 19.—This market is quiet with lower prices for tin and zinc. Quotations for copper are higher, though sales show no more activity. The old metal market is without feature.

Prices, per lb., in carload lots: Lake copper, 14.75c.; tin, 50.50c.; lead, 6.25c.; zinc, 6.25c.; in less-than-carload lots, antimony, 12.75c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.50c.; yellow brass, 7.25c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 30c.; tin foil, 36.25c.; block tin, 45.25c.; aluminum, 12c.; all being dealers' prices for less-than-carload lots.

RAILROAD EQUIPMENT

Ohio Colleries Co. has ordered 250 mine cars from American Car & Foundry Co.

Chicago, St. Paul, Minneapolis & Omaha has ordered 250 stock cars from an unnamed bidder.

Central Vermont will buy 10 2-10-4 type locomotives.

Sanitary District, Chicago, will purchase two 0-6-0 and two 0-4-0 type locomotives.

Celebrates Ninety-second Year

Something of the history, service facilities and products of the Shaw-Crane Putnam Machine Co., of the Manning, Maxwell & Moore, Inc., 100 East Forty-second Street, New York, is given in an attractive booklet recently issued under the title of "To Help You See Us as We See Ourselves." Exterior and interior views of the Shaw and Putnam plants are shown, as well as illustrations of the products of those companies, both for railroad and industrial use. The booklet, which is attractively arranged, is dedicated to Salmon W. Putnam, John Putnam and A. J. Shaw, founders of two of the subsidiary companies and commemorates the ninety-second anniversary (1836 to 1928) of the Putnam works of the company. The Shaw Electrice Crane Co. was founded in 1891 with a plant at Muskegon, Mich.

Steel boilers ordered in May are reported by the Department of Commerce at 1572 units with 1,453,672 sq. ft. of heating surface. This is the largest monthly total in some time. It compares with 1325 boilers and 1,295,170 sq. ft. in April. For the first five months the sales have been 6172 units and 6,122,741 sq. ft., against 6502 and 6,906,471 last year.

A gain in factory employment in Chicago, and an upward trend in eight out of 13 other leading Illinois cities in May, is reported in the monthly review of the bureau of labor statistics of the Illinois Department of Labor. Chicago showed an increase of 1.1 per cent, due principally to improvement in the metal, meat packing and printing industries.

The Pittsburgh Foundrymen's Association will hold its annual field day and outing at The Pines, on Perry Highway, near Keown, Pa., on Saturday, June 30.

Old Metals, Per Lb., New York

The buying prices represent what the large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.625c.	14.00c.
Copper, heavy and wire	12.50c.	13.50c.
Copper, light and bottoms	10.75c.	12.00c.
Brass, heavy	7.25c.	8.50c.
Brass, light	6.25c.	7.75c.
Heavy machine composition	9.75c.	11.00c.
No. 1 yellow brass turnings	8.50c.	9.375c.
No. 1 red brass or composition turnings	9.00c.	10.00c.
Lead, heavy	5.00c.	5.50c.
Lead, tea	4.00c.	4.50c.
Zinc	3.00c.	3.50c.
Sheet aluminum	12.75c.	14.50c.
Cast aluminum	12.50c.	14.00c.

REINFORCING STEEL

Awards Total About 3800 Tons—New Projects Include 8000 Tons In Canada

AWARDS of about 3800 tons of reinforcing bars were practically on a par with those of a week ago. Included were 600 tons for the New York Central terminal at Buffalo and 600 tons for a Buffalo public school. There were about 5000 tons of new projects in the United States; three Canadian inquiries call for a total of 8000 tons.

BOSTON, 300 tons, Noyes-Buick Co. plant, to Truscon Steel Co.

CAMBRIDGE, 275 tons, Harvard Law School addition, to Concrete Steel Co.

BROOKLYN, 130 tons, Brooklyn Union Gas Co., plant building, to McClintic-Marshall Co.

NEW YORK, 200 tons, Pier No. 3, North River, to Faitoute Iron & Steel Co., Newark.

STATE OF NEW JERSEY, 350 tons, State road from Deans to Cranbury Turnpike, to Igoe Brothers.

STATE OF NEW JERSEY, 250 tons, road work from Linden to Union, to Igoe Brothers.

ELIZABETH, N. J., 200 tons, storage warehouse, to Joseph T. Ryerson & Son, Inc.

PATERSON, N. J., 100 tons, bakery, to Igoe Brothers.

BUFFALO, 600 tons, canopy and track foundations, New York Central Terminal, to a local maker.

BUFFALO, 600 tons, school No. 81, to a local maker.

CLEVELAND, 1700 tons, Cleveland Union Terminal buildings, to Bourne-Fuller Co.

ST. LOUIS, 300 tons, first district, S. W., joint sewer, to Missouri Rolling Mills Corporation.

SEATTLE, 250 tons, small jobs to Northwest Steel Rolling Mills.

SEATTLE, 150 tons, foundations for Pacific Coast Cement Co., plant, to Pacific Coast Steel Co.

MOUNT VERNON, WASH., 147 tons, viaduct, to Northwest Steel Rolling Mills.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

MONTREAL, 1000 tons, warehouse: Perrault & Gadbois, Themis Building, architects.

TORONTO, 3000 tons, for Wellington Buildings, Ltd.

PROVIDENCE, R. I., 1665 tons, Washington bridge.

PORT CHESTER, N. Y., 175 tons, road work, general contract awarded to Peter Luciano & Sons, White Plains, N. Y.

LARCHMONT, N. Y., 125 tons, road work, contract let to Patterson Rissi Co., Torrington, Conn.

BROOKLYN, 2500 tons, building for New York Dock Co., general contract placed with White Construction Co.

CHICAGO, tonnage not stated, Chicago Women's Club; Holabird & Root, architects.

CHICAGO, 200 tons, including a tower on Palmolive-Peet Building.

CLEVELAND, 150 tons, building for Great Lakes Cement Co.

ST. LOUIS, 250 tons, packing house for Swift & Co.; previously reported as a structural steel project.

VANCOUVER, B. C., 4000 tons, medicinal and dental block for Baker, Stevens & Co.

SACRAMENTO, CAL., 120 tons, Cache Creek Bridge, bids opened.

Reporting net earnings for six months $546,563 less than last year, the Crucible Steel Co. of America has cut its dividend rate from 6 per cent annually to 5 per cent. The balance sheet shows a reduction of $1,000,000 in inventories and of $1,423,000 in total current assets, about equaled by the drop of $1,364,000 in total current liabilities. Half a million dollars has been cut from "property" account.

FABRICATED STRUCTURAL STEEL

Awards of 60,000 Tons Include 38,000 Tons for Chicago Project—15,000 Tons for Grade Crossing Elimination

With 38,000 tons required for a Chicago Mercantile Mart, awards the past week totaled over 60,000 tons, the largest in several weeks. New projects, totaling 37,000 tons, include 15,000 tons for grade crossing elimination at Cleveland.

BURLINGTON, VT., 750 tons, Rutland Railroad bridge, to McClintic-Marshall Co.

LUNENBERG, VT., 450 tons, Maine Central Railroad bridge, to American Bridge Co.

STATE OF VERMONT, 150 tons, State bridges, to Palmer Steel Co.

STATE OF VERMONT, 400 tons, highway bridges, to American Bridge Co.

EXETER, N. H., 200 tons, baseball cage, to Boston Bridge Works, Inc.

BOSTON, 100 tons, Meisel Press addition, to New England Structural Co.

BOSTON, 250 tons, continuation school, to New England Structural Co.

ANDOVER, MASS., 150 tons, building for Phillips Academy, to New England Structural Co.

NEW YORK, 1300 tons, three buildings for Tudor City, to Harris Structural Steel Co.

NEW YORK, 2500 to 3000 tons, loft building, to Levering & Garrigues.

NEW YORK, 400 tons, Union Indemnity Co., Maiden Lane, to Heddon Iron Construction Co.

JERSEY CITY, N. J., 225 tons, addition to St. Francis Hospital, to Fagen Iron Works.

WILKES-BARRE, PA., 1000 tons, for Wilkes-Barre Savings Bank, to local fabricators.

PHILADELPHIA, 2700 tons, Rittenhouse Square apartment building, to Shoemaker Bridge Co.

PHILADELPHIA, 2250 tons, Chateau Crillon apartments, to Bethlehem Fabricators, Inc.

PHILADELPHIA, 125 tons, building for William Steel & Sons, to American Fabricated Steel Co.

RICHMOND, VA., 2500 tons, rayon mill for E. I. du Pont de Nemours & Co., to McClintic-Marshall Co.

PENNSYLVANIA RAILROAD, 400 tons, bridges, to Shoemaker Bridge Co.

READING RAILROAD, 100 tons, bridges, to McClintic-Marshall Co.

WASHINGTON, 270 tons, arches for the Arlington Memorial bridge, to McClintic-Marshall Co.

BUFFALO, 1000 tons, Riverside High School, to Buffalo Structural Steel Co.

OIL CITY, PA., 300 tons, theater, to Jones & Laughlin Steel Corporation.

BIRMINGHAM, 250 tons, towboat for Tennessee Coal, Iron & Railroad Co., to American Bridge Co.

CHICAGO, 38,000 tons, Mercantile Mart, to Bethlehem Steel Co.

CHICAGO, 400 tons, Hyde Park State Bank building, to Union Foundry, local.

CHICAGO, 155 tons, Catholic school, to Hansell Elcock Co., local.

URBANA, ILL., 900 tons, buildings at University of Illinois, to Mississippi Valley Structural Steel Co.

LONG BEACH, CAL., 300 tons, office building at Pine and Ocean Avenues, to Llewellyn Iron Works.

SAN FRANCISCO, 275 tons of shapes and 525 tons of plates, carfloat for Western Pacific Railroad Co., to Moore Dry Dock Co.

SAN FRANCISCO, 175 tons, apartment building, Franklin Street, near Washington, to McClintic-Marshall Co.

SAN FRANCISCO, 160 tons, apartment building, Van Ness Avenue, near Lombard Street, to McClintic-Marshall Co.

LOS ANGELES, 118 tons, Union High School, to McClintic-Marshall Co.

STATE OF NEVADA, 900 tons, headframe and bins for a mine, to Kansas City Structural Steel Co.

LONGVIEW, WASH., 100 tons, telephone building, to Isaacson Iron Works.

KETTLE FALLS, WASH., 1100 tons, highway bridge, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

MONCTON, N. B., 1000 tons, rink and exhibition building for Moncton Exhibition Co.

MONTREAL, 3000 tons, warehouse; Perrault & Gadbois, Themis Building, architects.

NEW YORK, 500 tons, court house at 151st Street.

ATLANTIC CITY, N. J., 1500 tons, hotel for Providence Corporation.

LEHIGH VALLEY RAILROAD, 500 tons, bridges.

PHILADELPHIA, 500 tons, five cottages for Girard College; bids on general contract June 29.

PHILADELPHIA, 10,000 tons, department store for Strawbridge & Clothier; general contract to Turner Construction Co.

LOCKPORT, N. Y., 400 to 700 tons, Bewley Building; plans in preparation.

CLEVELAND, 450 tons, building for Ohio Bell Telephone Co.

ASHTABULA, OHIO, 160 tons, Pennsylvania Railroad bridge.

CLEVELAND, 15,000 to 20,000 tons, New York Central and Nickel Plate railroad grade crossing elimination.

CINCINNATI, 400 tons, theater.

CINCINNATI, 250 tons, power house for Christ Hospital.

BIG FOUR RAILROAD, 190 tons, two 110-ft. turntables.

PIQUA, OHIO, 100 tons, bank building.

SOUTH BEND, IND., 1000 tons, depot for New York Central Railroad; Walsh Construction Co., Davenport, Iowa, general contractor.

CHICAGO & NORTH WESTERN, 900 tons, bridge reinforcement.

CHICAGO, 1000 tons, bridges for sanitary district.

STATE OF ILLINOIS, 250 tons, highway bridges; Vincennes Bridge Co., Vincennes, Ind., low bidder.

STATE OF ILLINOIS, 500 tons, State highway bridges; Wickes Engineering Co., Des Moines, Iowa, low bidder.

ST. LOUIS, 1000 tons, building for American Railway Express Co. at Union Station.

ST. LOUIS, 500 tons, Marquette Building.

KANSAS CITY, MO., 130 tons, building No. 60 for Corn Products Refining Co.

SPOKANE, WASH., 1500 tons, Medico-Dental Building; bids being taken.

SAN FRANCISCO, 250 tons, warehouse for A. M. Castle Co.; bids being taken.

Conference and Exhibit of Industrial Advertisers

Too often advertising is depended on to correct mistakes of the sales plans, said George D. Crain, Jr., publisher of *Class and Industrial Marketing*, Chicago, in an address on "Advertising as a Spur to Industrial Marketing" before the seventh annual conference of the National Industrial Advertisers Association, at St. Louis, June 11. The sales plan, he emphasized, should be so good that successful results could be realized even without advertising. It is unfortunate for a company to go into advertising merely because it hears of successful advertising, particularly if it is not prepared in all other details.

In connection with the conference there was an exhibition of industrial advertisements and the awards included the following:

For the best exhibit, to Frederick Heitcamp, Cincinnati Milling Machine Co., with honorable mention to the Kearney & Trecker Corporation, Milwaukee.

For the best exhibit of a campaign in publications, Bakelite Corporation, with honorable mention to the Sivyer Steel Casting Co., Milwaukee.

For the best institutional advertising, to the Dodge Mfg. Co., Mishawaka, Ind.

For the best use of color in industrial advertising, to the Warner & Swasey Co., Cleveland.

For the best series of not less than 12 pieces of industrial advertising featuring news, to J. R. Hopkins, Chicago Belting Co.

For the best series featuring performance, prize given by THE IRON AGE, to the Vacuum Oil Co.

Officers Elected

Officers of the National Industrial Advertisers Association for the ensuing year were elected as follows:

President, Nelson S. Greensfelder, Hercules Powder Co., Wilmington, Del.

First vice-president, George H. Corey, Cleveland Twist Drill Co., Cleveland.

Second vice-president, Allan Brown, Bakelite Corporation, New York.

Third vice-president, H. von P. Thomas, Bussman Mfg. Co., St. Louis.

Secretary-treasurer, B. H. Miller, Permutit Co., New York.

PERSONAL

James Cleary has been appointed general sales manager of Combustion Engineering Corporation, 200 Madison Avenue, New York. He has been associated with this company since 1921, at first as district manager of the Philadelphia and Detroit offices and for the past two years as assistant general sales manager. His early business experience was as erecting and operating engineer for Westinghouse-Church-Kerr Co. In this connection he was sent to England as erecting and operating engineer on the Metropolitan Railway Co., London, the Mersey Railway Co., Liverpool, and the Clyde Valley Electric Power Co., Glasgow. Returning to this country, Mr. Cleary entered the employ of the Westinghouse Machine Co. In the Spanish-American War he served as chief machinist and warrant officer in the United States Navy. During the World War he was in charge of the steam equipment of the "Old Hickory" Government plant.

JAMES CLEARY

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A. B. Benson, formerly secretary and treasurer Conveyors Corporation of America, has been appointed general manager Joseph Harrington Co., subsidiary of Whiting Corporation, Harvey, Ill. The Harrington company is engaged in making an automatic stoker for heating and small power plant boilers. Mr. Benson's experience has been largely in the power plant field. His appointment will relieve Joseph Harrington, president, of much detailed administrative work and permit him to devote more of his time to the engineering features of the business.

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J. Wohlfeld, production engineer, 10228 Woodward Avenue, Detroit, has been appointed sales representative in Detroit of the Siewek Tool & Die Co., manufacturer of "rapid safety" drill jigs. He has also been appointed exclusive distributer in Detroit for products of the Universal Standard Co. He was most recently associated with Copeland products, representing various automotive and other tools. He is an active member of the Detroit Engineering Society and of the engineering division of the Detroit Industrial Safety Council. He is now operating under the title J. Wohlfeld Tool Design & Sales Co.

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William J. Myers, president Union Stove Works, New York, who has completed 50 years of uninterrupted service with the company, was the guest of honor at a dinner given June 8 at the Hotel Astor, New York, by employees. Mr. Myers started with the Union Stove Works in 1878 as an assistant bookkeeper and by various promotions reached the presidency. Other officers of the company and employees presented Mr. Myers with a gold watch.

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Glenn Coley, who has been chief metallurgist of the Titusville Forge Co., Titusville, Pa., for several years, has resigned to accept a position in the power sales department of the Detroit Edison Co., Detroit.

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Norman F. Robertson has been elected president of the John Robertson Co., Inc., 133 Water Street, Brooklyn, succeeding his father, the late Norman A. Robertson, who died on May 24. Mr. Robertson has been secretary of the company since 1924. Allan R. Hardie, treasurer, has now been made secretary and treasurer.

John D. Hurley, president Independent Pneumatic Tool Co., Chicago, will sail for Europe on July 12. While on the Continent Mr. Hurley will make a business tour of the company's foreign branches, returning to the United States the latter part of September.

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Allen A. Johnson, formerly secretary and treasurer and general manager of sales Eagan-Johnson Steel & Iron Co., Crum Lynne, Pa., has become New York district sales agent for the Lebanon Steel Foundry Co., Labanon, Pa., with office at 55 West Forty-second Street. Mr. Johnson is a son of Gilbert H. Johnson, Sr., treasurer and general manager Isaac G. Johnson & Co., Spuyten Duyvil, New York, and received his early training in the foundry of that firm.

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Thomas B. Frank, treasurer of the Cincinnati Planer Co., Cincinnati, has been elected a director of the National Association of Cost Accountants.

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C. E. Lex, Jr., has become associated with the Cincinnati Shaper Co., Cincinnati, as sales engineer.

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Dr. Samuel W. Stratton, president Massachusetts Institute of Technology, will be the speaker at the first meeting of the Worcester, Mass., Engineering Society. This will be a dinner-meeting on Friday, June 22, and will be held in the Sanford Riley Dormitory of the Worcester Institute of Technology.

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Charles H. Upson, for the past 23 years district manager for the Dodge Manufacturing Co., has joined the sales organization of the Chain Belt Co., Milwaukee. With headquarters at Cincinnati, he will represent the company's complete line of Rex chain and transmission machinery. He will devote practically all of his time to the interests and advancement of Rex chain.

CHARLES H. UPSON

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H. B. Hanley, metallurgist Whitehead Brothers, Rochester, N. Y., delivered an address before the New England Foundrymen's Association on Wednesday evening, June 13. His subject was "Molding Sand, Its Products and Uses."

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Warner A. Peck, who, as announced in THE IRON AGE last week, has been appointed assistant manager of sales for the Cincinnati office of the Republic Iron & Steel Co., has been Cleveland district sales manager of the Trumbull Steel Co. for the past nine years. He has been connected with the Trumbull company for 15 years, two years of which he spent in the New York sales office.

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Brice M. Mace, Jr., Lebanon, Tenn., has been appointed as trade commissioner at London. Until recently Mr. Mace was manager of the Kansas City office of the Department of Commerce.

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Joseph Lang, who has represented the du Pont Co. in the New York City territory for 43 years, is to be relieved of such duties as he may desire to relinquish. Effective June 15, R. H. Nicol has been transferred to the New York territory for this purpose. Mr. Nicol has been in the organization for 25 years.

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Willeby T. Corbett and Carroll O. Holmes have both been elevated to be vice-presidents of the United States Steel Products Co., New York. F. R. Sites, formerly attached to the office of chairman of the United States Steel Corporation, has been made assistant to the president of the Steel Products company.

OBITUARY

NORMAN A. ROBERTSON, president John Robertson Co., 133 Water Street, Brooklyn, hydraulic press manufacturer, died May 24 at his summer home at Spring Lake, N. J., after a short illness. Mr. Robertson was born in Brooklyn in 1870, the son of the late John Robertson, who founded the company bearing his name, and known also as the Tubal Cain Iron Works. He was graduated from the Brooklyn Polytechnic Institute and at once entered the employ of the company, with which he was associated for 40 years. He was well known in the electrical cable, rubber hose, blue lead and metal-working industries, for which he developed and built much special machinery. He was a member of the Engineers' Club and the Machinery Club, New York. His son, Norman F. Robertson, succeeds him in the presidency of the company.

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CHARLES T. STRAWBRIDGE, vice-president Bass Foundry & Machine Co., Fort Wayne, Ind., died at his home in that city on June 10 after an illness of several months. He was one of the pioneers in the industrial development of Fort Wayne, having been connected with the Bass company for 49 years, most of this time in an executive capacity. Mr. Strawbridge was born in Blooming Grove, Morrow County, Ohio, and received his early education in Bucyrus, Ohio. He was employed as a telegraph operator by the Pennsylvania Railroad from 1874 until 1879, in which year he entered the employ of the Bass company. He was elected secretary of the company in 1900 and a few years later was advanced to the position which he held at the time of his death. He served also as vice-president of the Rock Run Iron Co., Rock Run, Ala., and the Fort Wayne Foundry & Machine Co., both of which are interests of the Bass estate.

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GEORGE HERBERT LEAF, president and treasurer E. B Leaf & Co., dealer in iron and steel scrap, Real Estate Trust Building, Philadelphia, died June 12 at his home in that city.

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JOHN A. SHERMAN, Worcester, Mass., manufacturer and inventor, long identified with the oil burner industry, died on June 13 at his home in that city, at the age of 56 years. He was president of the Sherman Oil Burning System.

WILLIAM S. GOLDSMITH, formerly superintendent Central Works, American Steel & Wire Co., Worcester, Mass., but for the past 15 years superintendent of the Townsend Co., New Brighton, Pa., died at the home of his son, William F. Goldsmith, Worcester, on June 12.

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HARVEY D. GOULDER, long prominently identified with the shipping industry on the Great Lakes, died June 14, at the age of 75 years. For many years up to 1925 he was counsel for the Lake Carriers' Association. At the time of his death he was a director of the Wilson Transit Co. and of the Cleveland & Buffalo Transit Co., and general counsel for the Great Lakes Protective Association.

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JOHN H. GRACE, head of the railroad equipment company in Chicago which bore his name, died June 14, at Oak Park, Ill. Mr. Grace, who was 59 years old, was for 26 years assistant general appraisal agent for the Chicago & Northwestern Railroad.

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WILLIAM H. BOWMAN, Worcester, Mass., treasurer of the Warren Belting Co. of that city since 1919, and previously with the Graton & Knight Mfg. Co., died June 17, at the age of 61 years. He was a native of Elmira, N. Y.

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FREDERICK H. PARKE, Pittsburgh district general engineer, Westinghouse Air Brake Co., died at his home in Wilmerding, Pa., June 16. He was born in Oshkosh, Wis., and was graduated from Cornell University in the class of 1892. For the next six years he was with the Westinghouse Machine Co., and then joined the Air Brake company. Soon afterward he went to Russia and assisted in the construction of an air brake plant in St. Petersburg, and in the organization of the mechanical and engineering department.

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DAVID C. HITCHNER, retired president of the H. B. Underwood Corporation, engineer and machinist, Philadelphia, died June 16 at his home in Elkins Park. He began more than 30 years ago at the Underwood plant as a machinist and worked his way to the presidency.

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PAUL R. CHUBBUCK, who died in Streator, Ill., May 29, was practically bankrupt 15 years ago when the old Halladay Automobile Co., Streator, failed. But he left an estate of nearly $500,000 when he died, his will revealed when filed for probate. He was founder of the Streator Metal Stampings Co. and his estate consisted chiefly of stocks and bonds in that company.

Arc-Welded Railroad Bridge

At the regular monthly meeting of the Pittsburgh chapter American Welding Society, at the William Penn Hotel, Pittsburgh, Wednesday evening, June 13, Gilbert D. Fish, consulting engineer Westinghouse Electric & Mfg. Co., described in detail the arc-welded railroad truss bridge erected at Chicopee Falls, Mass., for the Boston & Maine Railroad. In his talk, which was illustrated by a large number of lantern slides depicting the structure and its details, he recounted the design, details and execution of the work and pointed out its unconventional features.

Construction Institute Offers Services in Government Building Program

Charles F. Abbott, executive director, and Lee H. Miller, chief engineer, American Institute of Steel Construction, Inc., called at the White House June 13 to pay their respects to President Coolidge, and later appeared before James A. Wetmore, acting supervising architect, and his staff to explain the merits of steel-frame construction in connection with a $250,000,000 public building program just authorized. It was suggested that considerable savings on this work can be effected through adoption of the institute's standard specifications and code of practice.

In commenting on the conference, Mr. Abbott quoted William Gompert, superintendent of school buildings of New York, as stating that the city would have saved $540,000 in first costs if the institute's specifications had been applied to 50 school buildings contracted for in 1924. Mr. Abbott also called attention to the fact that the institute recently prepared standard specifications for fireproofing structural steel, which will make it possible to design as effectively against the fire hazard as against the stress of live and dead loads.

Russia Exports Scrap to France

PARIS, FRANCE, June 15.—The official agency of the Russian Government in France has announced that there are immense supplies of metal scrap in Russia, which need reassembling and classification. While the larger part of these supplies will be utilized in Russia by local metallurgical works, a few lots which could not be consumed locally, but which were of sufficient value to warrant export sale, have been sold abroad. During the first half of this year Russia has shipped 180 tons of non-ferrous metal scrap to France, valued at 870,000 fr. ($34,191).

Flinn & Dreffein Co., Chicago, has obtained a contract to build a continuous billet-heating furnace, producer-gas fired, for the Acme Steel Co., Chicago. This furnace will be the third such unit at the Riverdale, Ill., plant of this steel company.

Machinery Markets and News of the Works

PURCHASES AT FAIR RATE

Equipment for Replacement Still the Major Source of Business

Harvester Company Contemplates Plant Addition—Boston Schools to Take Several Lathes

MACHINE tool orders booked so far this month compare favorably with those of the latter part of May. In the Chicago district, business taken by dealers may even exceed that of the last half of May, the increase being attributed to the placing of the bulk of the list for the Waterloo, Iowa, plant of Deere & Co. In some districts the steady flow of inquiry is taken to indicate that mid-summer buying may be at a better rate than usual.

The present status of equipment demand is accounted for in the monthly review of the National Machine Tool Builders' Association as follows: "The prevalence of low rates on borrowed capital is making it possible for all sound industries to borrow as much as they need for revamping their plants. Progressive companies seem to be doing this very thing. This would account in considerable measure for the present level of demand for various classes of equipment, including machine tools." In the index of machine tool orders for May, issued by the same association, the following comment is made: "Volume of orders for May slipped down somewhat from the point reached in April, but not enough to turn the three-months trend line downward. However, a seasonal falling off is usual over the summer months and it is likely that the trend line has reached its peak for a few months at least."

Railroad business has been quiet during the past week. The New York Central has placed a few tools, and the Santa Fe is reported to have closed for all of its requirements except some large special lathes. The Burlington railroad is expected to take action soon on a number of machine tools, previously inquired for, and there are indications that the New England railroads will come into the market within the next 10 days.

Automotive buying has been comparatively light and, for the most part, is for replacement purposes. One exception was the purchase of 12 automatic lathes by a Michigan company.

Contemplated additions to the tractor manufacturing facilities of the International Harvester Co. are expected to involve a number of new machine tools.

Bids on 15 lathes for the Hyde Park district high school have been requested by the city of Boston, which, within the next two weeks, will again make inquiries on the same number of lathes and later will get prices on a number of items of miscellaneous equipment.

Small tool sales have been at a moderately good rate.

New York

NEW YORK, June 19.

MACHINE-TOOL buying in this district continues at a moderately good rate, and it now seems likely that June sales may equal those of last month. Purchases have been mainly single tools. The New York Central has bought two or three tools, but otherwise railroad business has amounted to little. A fairly steady flow of inquiries seems to indicate that mid-summer buying may be at a better rate than usual.

Among sales of the week were 15 lathes by the Niles-Bement-Pond Co. to various companies. Some of them were sold in the West. This company also sold two used Niles 50-in. vertical drilling machines, a used Leblond No. 4 universal milling machine, an 8-in. rotary surface grinder, three 3-ft. radial drills, five Ransom grinders, a 30-in. x 28-ft. Time-Saver lathe, a used 42 x 42-in. x 10-ft. Pond planer. The Pratt & Whitney Division sold three 14-in. vertical surface grinders, three 13 x 30-in. lathes, two 16 x 36-in. lathes, three automatic lathes, three universal die sinkers, two jig borers and four Sigourney drilling machines and a number of single tools.

Plans are under way by Gulf Refining Co., 21 State Street, New York, for new refinery, storage and distributing plant at Mariners Harbor, Staten Island, comprising nine units, with power house, machine shop and other departments. Facilities will be provided for handling crude oil from seagoing tankers, including pumping machinery, etc. Entire project is estimated to cost in excess of $15,000,000. Headquarters of company are in Frick Annex, Pittsburgh; William M. Braybrooks is general manager.

Columbia Metal Box Co., 228 East 144th Street, New York, is having plans drawn for two-story addition, to cost close to $100,000 with equipment. George A. Bagge & Sons, 157 East Forty-fourth Street, are architects.

Excello Spring & Mfg. Co., 176 Grand Street, New York, has leased space in building at 161-63 Grant Street for expansion and will remove to new location.

Harry Silverstein, 26 Court Street, Brooklyn, architect, has plans for a two-story automobile service, repair and garage building, 120 x 150 ft., to cost close to $150,000 with equipment.

Northern Westchester Lighting Co., Ossining, N. Y., has approved plans for new automatic power substation to cost about $85,000 with equipment. Thomas E. Murray, Inc., 52 Duane Street, New York, is architect and engineer.

Board of Education, Yonkers, N. Y., is considering installation of manual training equipment in new three-story high school, to cost more than $650,000 with equipment. G. H. Chamberlain, 18 South Broadway, architect, is revising plans and will soon take bids on general contract. Clark, McMullen & Riley, 101 Park Avenue, New York, are mechanical engineers.

John Hoffman, Jr., 527 Hunts Point Avenue, New York, manufacturer of hod elevators, contractors' hoists, etc., has filed plans for one-story addition, 100 x 100 ft., to cost about $32,000. S. F. Oppenheim, Inc., 156 East Forty-second Street, is architect.

Albany Packing Co., Inc., Exchange Street, Albany, N. Y., plans installation of mechanical handling and conveying equipment, refrigerating machinery, etc., in three-story addition to cost in excess of $300,000, for which plans are being drawn by Henschien & McLaren, 1637 Prairie Avenue, Chicago, architects and engineers.

Manifold Supplies Co., 188 Third Avenue, Brooklyn, manufacturer of paper products, has plans for a three-story factory, including improvements in present plant, to cost about $50,000 with equipment.

Utility Oil Corporation, Bridge Plaza North, Long Island City, has leased property at Anable Avenue and Honeywell Street, totaling about 26,000 sq. ft. floor space, for a new service, repair and garage unit, with oil storage and distributing facilities.

Melrose Motor Co., 598 Bergen Avenue, New York, will soon ask bids on general contract for new two-story service, repair and garage building, to cost about $145,000 with equipment. George A. Bagge & Sons, 157 East Forty-fourth Street, are architects.

Smith-Hamburg-Scott Welding Co., Marion Place, Long Island City, has acquired adjoining property, 100 x 102 ft., and plans erection of new plant to occupy entire site. Present works are on leased site and it is understood that production will be concentrated in new unit.

Public Service Electric & Gas Co., Public Service Terminal, Newark, has acquired property on Staten Island Sound, extending from Sewaren to Port Reading, N. J., as site for new electric generating plant, to cost more than $750,000 with transmission lines. No time has as yet been scheduled when work will begin. Company has also secured right-of-way for construction of new transmission line in Essex, Union and Middlesex Counties. Plans have been completed for two-story power substation at 271 Sip Avenue, Jersey City, to cost more than $85,000 with equipment.

Ovens, power equipment, conveying and other machinery will be installed in a new three-story plant, 100 x 200 ft., to be erected by H. F. Runkel Bakery, 1141 East Grand Street, Elizabeth, N. J., to cost in excess of $350,000. Herman F. Runkel is head.

Board of Education, Oradel, N. J., is considering installation of manual training equipment in a new three-story junior high school to cost $350,000, for which plans are being drawn by Coffin & Coffin, 522 Fifth Avenue, New York, architect.

American Copper Products Corporation, Bayway, Elizabeth, N. J., manufacturer of copper and brass wire specialties, has awarded general contract to Wigton-Abbott Corporation, 552 West Twenty-third Street, New York, for a one-story addition, 105 x 475 ft., to cost about $80,000 with equipment.

Middlesex County Vocational School Board, New Brunswick, N. J., is considering an addition to local County vocational school No. 1, to cost more than $250,000 with equipment.

Radio Tube Corporation, 88 Eighth Avenue, Newark, has plans for a new three-story plant, to cost close to $65,000 with equipment. Siegler & Greenberg, 164 Market Street, are architects.

Following recent termination of receivership and reorganization, DeForest Radio Co., 139 Franklin Street, Jersey City, N. J., will carry out an expansion and improvement program at plant, including installation of equipment to replace old machinery for production of radio sets, tubes, etc. Company will be affiliated with Sonora Phonograph Co., 16 East Fortieth Street, New York, in production of products noted as well as talking machines and parts. James W. Garside is president, and Robert Buchanan, secretary and treasurer.

Betz Brothers, Inc., manufacturer of hollow metal doors and trim, is occupying its new factory building at Clifton, N. J., added facilities including 70,000 sq. ft. of floor space.

Key City Bolt & Spike Works, Bayonne, N. J., recently incorporated with a capital stock of $100,000 to manufacture bolts, nuts, etc., is erecting a plant at Hudson Boulevard and Morris Canal. Officers of company are: C. H. Carpenter, president and treasurer, S. C. Gartley, vice-president and general manager, and E. Zehner, secretary.

Norris Brush Works, River Edge, N. J., which has been engaged in manufacture of toilet brushes for several years, has been incorporated in anticipation of enlargement of business. Walter Randall is president, Howard E. Norris is treasurer.

Philadelphia

PHILADELPHIA, June 18.

PROPERTY at 1639-41 Hunting Park Avenue, Philadelphia, has been purchased by Philadelphia Indian Motorcycle Co., 4153 Germantown Avenue, as site for new service, repair and sales building to cost more than $50,000, for which plans will soon be drawn.

Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia, manufacturer of mechanical drying equipment, air conditioning machinery, etc., has awarded general contract to Austin Co. for two-story and basement addition, 50 x 146 ft., to cost upward of $65,000 with equipment. Day & Zimmermann, Inc., 1600 Walnut Street, is engineer.

Klein Stove Co., Trenton Avenue and Tioga Street, Philadelphia, has plans for a one-story addition.

Hess Iron Works, Philadelphia, recently formed by J. F. Hess, 2507 East Westmoreland Street, and associates, with capital of $25,000, is arranging for operation of local plant for manufacture of iron and metal products.

Ero Mfg. Co., 2234 Ogden Avenue, Chicago, manufacturer of automobile equipment and supplies, has leased space in building at Hope and Palmer Streets, Philadelphia, for new factory branch and distributing plant.

William Steele & Sons Co., 219 North Broad Street, Philadelphia, engineer and contractor, has plans for a four-story automobile service, repair and garage building to cost $450,000 with equipment.

Laurence R. Wilder and other officials of American Brown Boveri Electric Corporation, 420 Lexington Avenue, New York, have formed Transoceanic Corporation to purchase and operate shipbuilding branch of first-noted company at Camden, N. J. American Brown organization will retain portion of land and buildings for continuance of manufacture of heavy electrical machinery, including generators, etc. Purchasing company plans to expand shipyard operations for building electrically-propelled vessels. Moloney Electric Co., Seventh and Hickory Streets, St. Louis, manufacturer of transformers, a subsidiary of American Brown company, will also be sold. W. M. Flock, chairman of executive committee of parent organization, will be identified with new Transoceanic Corporation.

Borough Council, Beach Haven, N. J., has approved plans for extensions in municipal electric power plant, including installation of additional equipment, to cost $50,000, and has authorized appropriation in amount noted. W. H. Boardman is borough engineer, in charge.

Empire Tool Works, Gloucester, N. J., has taken over former local plant of Rogers Drill Works, and will begin operations for manufacture of tools and kindred products.

Samuel Winterbottom Sons, Liverpool Avenue and line of Philadelphia & Reading Railway, Egg Harbor City, N. J., manufacturer of knife handles, etc., plans rebuilding portion of plant destroyed by fire June 11, with loss reported at more than $30,000 with equipment.

Atlantic Refining Corporation, 260 South Broad Street, Philadelphia, is said to be planning construction of new oil storage and distributing plant at Jacksonville, Fla., where 6-acre tract has been secured adjoining property of Seaboard Oil Co. Project is reported to cost in excess of $100,000; all equipment will be electrically operated.

Cheming Telephone Co., 123 Lockhart Street, Sayre, Pa., will soon ask bids on general contract for two-story equipment storage and distributing plant, with repair facilities, etc., to cost more than $35,000. H. C. Child, 501 South Keystone Avenue, is architect.

City Council, Reading, Pa., has passed ordinance for establishment of municipal machine shop, and will arrange appropriation at early date.

Hinaman Aircraft Corporation, Williamsport, Pa., recently chartered, is completing plans for operation of a local plant. R. W. Howard, Williamsport, is head.

National Supply Co. of Delaware, Inc., Toledo, Ohio, will take over plant and property of Superior-Otto Engine Works, Thirty-third and Walnut Streets, Philadelphia, and Superior Gas Engine Co., Springfield, Ohio, an affiliated organization, and will consolidate. It is understood that both plants will be continued as heretofore. An expansion program for increased output is under consideration.

George K. Hale Mfg. Co., Third and Cumberland Streets, Philadelphia, manufacturer of buttons, etc., has acquired property at Mount Airy, N. C., and is reported planning establishment of new works to cost in excess of $50,000.

Following recent purchase of tube mill of Superior Pipe Co., Columbia, Pa., by Tyler Tube Co., Washington, Pa., new owner is planning removal of equipment to main plant at last noted place, where production will be concentrated and expansion carried out. Superior works have been idle for several years.

Overbrook Steam Heat Co., Woodbine and Upland Avenues, Philadelphia, has plans for addition to power house, and installation of boilers and auxiliary equipment.

Ford & Kendig Co., 1428 Callowhill Street, Philadelphia, jobber of steam, plumbing, mill, mine, railroad and contractors' supplies, has elected Leighton M. Ford, president to succeed his father, late Albert E. Ford, founder of company. Other new officers are: T. J. Williams, vice-president; T. B. Reeves, second vice-president, and H. K. Strickler, secretary-treasurer.

Buffalo

BUFFALO, June 18.

PLANS are being arranged by New York Central Railroad Co., Buffalo, for a new one and two-story car repair shop at local East Yards, to cost more than $85,000 with equipment. A two-story Pullman car shop is also planned at same location. F. B. Freeman, company headquarters, 466 Lexington Avenue, New York, is chief engineer, in charge.

Consolidated Aircraft Corporation, 2650 Elmwood Avenue, Buffalo, has taken over portion of neighboring building occupied by enameling works of American Radiator Co., and will equip for experimental work and manufacture of

new type of naval bombing and patrol, all-metal, twin-motored monoplanes for Covernment, for which special contract recently has been secured. Extension will be known as Engineering Unit No. 2.

Buffalo, Niagara & Eastern Power Corporation, Buffalo, is disposing of a preferred stock issue to total $34,475,000, a portion of proceeds to be used for expansion and improvements and for consolidation of group of local utilities, including Buffalo General Electric Co., Niagara Falls Power Co., Tonawanda Power Co., and others. Company has work under way on new steam-operated electric generating station, designed for ultimate output of 100,000 hp. Extensions will be made in transmission lines.

American Radiator Co., Elmwood Avenue, Buffalo, has purchased Locke Pattern Works, Inc., 3224 East Jefferson Street, Detroit, and Ypsilanti Motor Casting Co., Ypsilanti, Mich., and will consolidate with its organization. Both companies have been producing castings for purchasing organization and plants will be continued in service as heretofore.

George A. and Edwin G. Guenther, 1281-85 Jefferson Avenue, Buffalo, operating a plumbing and heating works, and hardware business, respectively, have organized Guenther Mfg. Co., with capital of $150,000, to consolidate present works and develop a plant for manufacture of gas-burning equipment, radiators, etc.

Fairbanks Valve Co., Glenwood Avenue and Main Street, Binghamton, N. Y., has awarded general contract to A. W. Bowie, Inc., Press Building, for rebuilding portion of plant destroyed by fire recently to cost in excess of $125,000 with equipment. Headquarters are at Lafayette and Broome Streets, New York.

Syracuse Lighting Co., Syracuse, N. Y., will take over and consolidate Seneca River Power Co., Baldwinsville, N. Y., and vicinity. New owner plans expansion in that vicinity, including transmission line construction.

Percy H. Smith, 57 East Fourth Street, Dunkirk, N. Y., and associates have formed Thrasher Mfg. Co., with capital of $50,000 and headquarters at Perrysburg, N. Y., where it is planned to operate a plant for manufacture of tools, instruments and kindred products. James E. Bixby, Gowanda, N. Y., is also interested in new company.

J. P. Devine Mfg. Co. has been organized and has succeeded to business of J. P. Devine Co., Buffalo, manufacturer of vacuum dryers, evaporators, and chemical apparatus. Reorganization was brought about by purchase of a large interest in business of Mount Vernon Car Mfg. Co., Mount Vernon, Ill. Walter C. Arthurs, president Mount Vernon Car Mfg. Co., becomes chairman of board of J. P. Devine Mfg. Co. Other officers are: Joseph P. Devine, president; H. H. Cust and C. P. Devine, vice-presidents; C. W. Reynolds, secretary; D. P. Settlemire, treasurer; Graham Devine, assistant to president and plant manager. Company plans enlargement of its present works at 1372 Clinton Street, Buffalo, and will also expand its various technical and research departments. A part of this expansion is under way.

Gears & Forgings, Inc., Cleveland, manufacturer of gears, forgings, speed reducers and special machinery, has appointed Potter & Dugan, Inc., Erie County Bank Building, Buffalo, district sales representative for Buffalo and vicinity.

South Atlantic States

BALTIMORE, June 18.

A TRACT of 46 acres at Fairfield, Baltimore, with 1500 ft. water frontage on Patapsco River, has been purchased by Asiatic Petroleum Co., Ltd., 65 Broadway, New York, as site for new oil refinery, storage and distributing works, with asphalt division, to cost close to $1,000,000 with equipment.

Dixie Aircraft Corporation, care of I. L. Paisley, Frederick, Md., recently formed by Mr. Paisley and associates, has acquired 160 acres near Amherst Highway, Lynchburg, Va., as site for new aircraft assembling plant, to specialize largely in production of all-metal monoplanes. Initial works are reported to cost in excess of $50,000, with equipment.

Georgia Vineyard Co., American Railway Exchange Building, Savannah, Ga., is reported planning construction of packing, storage and distributing plants, including conveying, elevating and other mechanical equipment, warehouse trucks, etc., to cost in excess of $100,000.

General purchasing officer, Panama Canal, Washington, is asking bids until June 27 for one electrically-operated engine lathe; two power hack saws; one electrically-operated shaper; 12 pneumatic chipping hammers; pipe machine, and other mechanical and electrical equipment, Panama schedule 1882; until July 2 for pipe and fittings, railing fittings, foundry brushes, warehouse trucks, ladders, etc., Panama schedule 1883.

Wilson-Smith Veneer Co., Dillon, S. C., plans early purchase of tools and equipment in connection with mill expansion and improvement, including power-operated veneer clipper, double cut-off saw, glueing machinery, etc.

Board of Forsyth County Commissioners, Winston-Salem, N. C., is planning an expansion program at Miller municipal airport, including construction of hangars, repair shops and other units.

C. H. Braun & Sons, Willow Street, Mount Winans, Baltimore, manufacturers of fertilizers, etc., have acquired grinding division of plant of J. H. Cottman & Co., Weaver Street, manufacturers of chemicals, and will use in connection with expansion program.

United States Shipping Board, Washington, will receive bids until July 6 for fire brick refractories and fire clay for six months' period beginning Aug. 1, proposal 141.

Swift & Co., Chicago, meat packers, are said to be concluding negotiations for purchase of plant of Georgia Cotton Oil Co., Waterville Road, Macon, Ga., and will operate as branch factory. Company is also arranging for purchase of mill of Alabama Cotton Oil Co., Montgomery, Ala.

Lanier Furniture Co., Statesville, N. C., recently formed with capital of $150,000, has acquired local plant of Iredell Upholstered Furniture Co., and will remodel and install additional machinery. L. L. Lanier is head.

Thomas J. Blackburn, 500 West Trade Street, Charlotte, N. C., operating radio station WBT, plans early purchase of two 200-ft. steel radio towers, self-supporting type, hot galvanized, with and without insulated bases on each leg.

Capital Granite Co., Oxford, N. C., Robert G. Lassiter, president, plans installation of granite crushing mill in connection with granite quarry near Blairs, S. C., including electrically-operated crushers, hoisting and conveying machinery, etc.

Board of City Commissioners, Asheville, N. C., is considering construction of pipe line from South Mills River to West Asheville, in connection with extensions in municipal waterworks, to include pumping machinery and auxiliary equipment. Entire project is reported to cost in excess of $1,000,000. Howerton Engineering Co., Medical Building, is engineer.

J. E. Beaman, Lawyers' Building, Raleigh, N. C., contractor, has filed plans for two-story automobile service, repair and garage building, to cost close to $90,000 with equipment, to be operated by Perin W. Cower, Raleigh, and associates.

New England

BOSTON, June 18.

WITH the majority of New England machine-tool dealers business is almost at a standstill. Some dealers, however, have closed enough business, and have assurances that additional orders are within grasp, to give the general market a brighter aspect. One company reports the sale of a 16-in. lathe to a Massachusetts shop, a similar machine to a Rhode Island plant, a radial drill to a middle Massachusetts manufacturer and a 13-in. lathe to another Massachusetts plant, in addition to a 30-ton crane. The Pneumatic Drop Hammer Co., Boston, has sold three 600-lb. hammers in Indiana, one of the same size in North Attleboro, Mass., and a smaller one to a Detroit manufacturer, and expects an order from a New England plant for a battery of hammers varying in size. Another company has sold two new cutter grinders. A new gear cutter has been placed, together with a moderate amount of low-priced used equipment.

The city of Boston is asking bids on 15 lathes for its Hyde Park district high school, and within a week or two it will inquire for 15 additional lathes, and later for a quantity of miscellaneous equipment. New England railroads and several industrial plants are expected to close on inquiries within the next 10 days.

Based on industrial plant activity in New England, there seems to be little prospect of any sizable activity in the machine-tool market in the near future. Shops, collectively, are growing less rather than more active. An increase in unemployed skilled mechanics is reported this week. With shops, business is spotty, and the same is true of machine-tool builders. A Connecticut tool maker has just received a large order for 13-in. lathes, necessitating the calling in of exhibition tools on the floors of outlying representatives. This builder is operating 100 per cent of capacity. Small tool sales have tapered off, but in the weekly aggregate a good comparative showing is made.

A $40,000,000 electric power development on the Connecticut river at Dalton, N. H., and Lunenburg, Vt., including

The Crane Market

INQUIRIES for single installations of overhead equipment continue in fair volume, but only a small number of locomotive crane inquiries are in the market. In the past fortnight, one Eastern crane builder has booked orders for 15 cranes. Among current inquiries is a list of high speed, long lift electric hoists for Canada, inquired for by Fox Brothers & Co., 12 East Forty-fourth Street, New York. The inquiry calls for one electric hoist capable of lifting 10,000 lb. at 250 ft. per min., with 1000 ft. of cable on the drum and four electric hoists of 2500 lb. lifting capacity at the same rate.

Among recent purchases are:

Panama Canal Commission, Washington, 30-ton locomotive crane from Ohio Locomotive Crane Co.

Textile Machinery Corporation, Reading, Pa., seven 5-ton electric traveling cranes from Niles Crane Corporation.

Pennsylvania Railroad, Philadelphia, 20-ton, overhead crane for Wilmington shops, from Niles Crane Corporation.

New York Central Railroad, New York, 10-ton, 67-ft. 3¼-in. span. overhead crane with 3-ton auxiliary for West Albany from Niles Crane Corporation.

New York, New Haven & Hartford Railroad, New Haven, 30-ton, 47-ft. 2¾-in. span overhead crane for Van Ness shops from Niles Crane Corporation.

Westcott & Mapes, New Haven, Conn., 25-ton locomotive crane for United Illuminating Co., New Haven, from American Hoist & Derrick Co.

American Electrical Works, Providence, R. I., nine ½-ton electric hoists from an unnamed builder.

American Printing Co., Fall River, Mass., five ¼-ton chain blocks from an unnamed builder.

Aluminum Co. of America, Pittsburgh, two 100-ton overhead cranes with 15-ton auxiliaries for Calderwood, Tenn., power plant from Whiting Corporation.

Weirton Steel Co., Weirton, West Va., 10-ton bucket crane, 7½-ton charging machine and one 200-ton stripper crane from Morgan Engineering Co. and 10-ton dock crane from Alliance Machine Co.

University of Illinois, Urbana, Ill., overhead electric crane for the material testing laboratory from Cleveland Crane & Engineering Co.

Deere & Co., Waterloo, Iowa, a coal handling crane from Milwaukee Electric Crane & Mfg. Corporation, a power house crane from Whiting Corporation, and a sand handling and a foundry crane from Cleveland Crane & Engineering Co.

Harrison Engineering & Construction Co., Kansas City, Mo., 18-ton, 8-wheel gasoline-type crane from Orton Crane & Shovel Co.

several power houses and a machine shop is contemplated. Details will be announced shortly.

Equipment of Standard Valve Mfg. Co., 81 Wareham Street, Boston, including a fairly large assortment of metal-working tools was sold June 13 at public auction at reasonable prices. Company is in process of liquidation.

New England High Carbon Steel Co., Millbury, Mass., has plans for a power house, 60 x 100 ft. Carl T. Lund, president Millbury Steel Foundry Co.; William Brierily, president A. D. Windle Co. and Richard French Iron Works, are interested in company.

Martin Trailer Co., Easthampton, Mass., is moving its business and machinery to plant formerly occupied by Planet Co., Westfield, Mass. Officers are Howard Swift, president; John R. King, vice-president, and Charles E. Harris, secretary and treasurer.

Plans are being arranged by American Writing Paper Co., Holyoke, Mass., for extensions and improvements, including new mill units and additional machinery, to cost close to $500,000.

Lynn Ornamental Iron Works, 966 Broad Street, Lynn, Mass., has asked bids on general contract for a one-story addition, to cost about $20,000 with equipment. Sanborn & Weed, Item Building, are architects.

Underwood-Elliott Fisher Co., 30 Vesey Street, New York, recently formed by merger of Underwood Typewriter Co., address noted and Hartford, Conn., and Elliott Fisher Co., Harrisburg, Pa., has arranged for purchase of Underwood Computing Machine Co., Hartford, heretofore owned by interests connected with Underwood Typewriter Co., and will consolidate with its organization. Purchasing company has engaged Lockwood, Greene & Co., 24 Federal Street, Boston, to prepare plans for new power house on Capitol Avenue, Hartford, to cost about $250,000 with equipment. Completion is scheduled by close of year.

Board of Selectmen, Hanover, N. H., has plans for two-story municipal automobile service, repair and garage building, 50 x 92 ft., to cost close to $65,000 with equipment. Wells & Hudson, Hanover, are architects.

Farrel Foundry & Machine Co., Waterbury, Conn., has plans for a three-story addition, 85 x 200 ft., to cost in excess of $100,000 with equipment. Fred A. Webster, Waterbury, is architect.

Providence Produce Warehouse Co., Providence, R. I., recently formed as a subsidiary of New York, New Haven & Hartford Railroad Co., Providence, plans construction of new terminal storage and distributing plant at Kinsley and Harris Avenues, with mechanical handling equipment, refrigerating apparatus, etc., to cost $750,000. Engineering department of railroad is in charge.

Hedstrom Union Co., Gardner, Mass., manufacturer of infant and juvenile vehicles, parts, etc., has asked bids on general contract for a three and four-story addition, 60 x 132 ft., and 40 x 60 ft., to cost close to $135,000 with equipment. G. A. Johnson, 16 Norwich Street, Worcester, Mass., is architect.

Haverhill Gas Light Co., Haverhill, Mass., will carry out an expansion and improvement program at artificial gas plant to cost about $270,000, including new gas holder with capacity of 3,000,000 cu. ft., and installation of equipment in plant. The sale of 9828 shares of stock is planned, a portion of proceeds to be used for work.

Package Machinery Co., Springfield, Mass., has purchased Ferguson & Haas, Inc., 515 Greenwich Street, New York, manufacturer of wrapping machinery and will consolidate with organization. Production will be concentrated at Springfield and equipment of acquired company removed to that location.

Public Electric Light Co., St. Albans, Vt., has applied for permission to issue additional stock to total about $45,000, practically entire proceeds to be used for expansion and improvements, including transmission line construction. Headquarters are at 161 Devonshire Street, Boston.

Chicago

CHICAGO, June 18.

WITH orders in the mail for the bulk of the large tool list for the Waterloo, Iowa, plant of Deere & Co., dealers in this district are counting on a two weeks' business that will better the last half of May. Miscellaneous orders are more numerous and new business in sight gives promise that June will be one of the best months so far this year. The Santa Fe has closed for all its requirements except several large special lathes, and it is probable that the Burlington Railroad will soon take action on a number of machine tools, inquiries for which have been issued over the last several months. The International Harvester Co. is contemplating additions to its tractor manufacturing facilities and will need a number of machine tools. The General Electric Co. has not taken action on the tools it needs at Chicago.

The Lapham-Hickey Co., Chicago, iron and steel warehouse, has contracted for 28,000 sq. ft. of land at Forty-seventh Place and South Turner Avenue, for erection of a one-story building.

Phillip Gollner Plumbing Supply Co., Chicago, suffered a loss of $200,000 when its plant recently was destroyed by fire.

Pheoll Mfg. Co., Chicago, manufacturer of screws, will build a one-story addition, 100 x 300 ft. Alfred S. Alschuler, 28 East Jackson Boulevard, is architect.

Hawkeye Tin Shop, 96 Second Avenue, Cedar Rapids, Iowa, manufacturer of furnaces, spouting and other sheet metal work, has been incorporated, but contemplates no other changes in its business. E. H. Gundling is proprietor.

Belmont Sheet Metal Works, 2341 Belmont Avenue, Chicago, will soon begin superstructure for new one-story and basement plant to cost about $30,000 with equipment. Olsen & Urbain, 228 North La Salle Street, are architects.

W. F. Meyers Co., Bedford, Ind., operating a local machine shop, has leased a two-story building at 2830-32 West Lake Street, Chicago, and will remove to that location where capacity will be increased.

State Mfg. Co., 4041 South Kedzie Avenue, Chicago, manufacturer of polishers' equipment and supplies, has awarded general contract to H. N. Samuel, 53 West Jackson Boulevard, for new one-story plant, 60 x 100 ft., to

cost about $32,000 with equipment. A. Epstein, 2001 West Pershing Boulevard, is architect.

Adams Co., 111 West Sixth Street, Dubuque, Iowa, manufacturer of milling machines and other machine tools, has awarded general contract to W. L. Yokom, 730 Main Street, for one-story addition, 80 x 220 ft., to be used for foundry and machine shop to cost about $65,000 with equipment.

Marshalltown Trowel Co., Marshalltown, Iowa, manufacturer of hardware products, is planning an addition to cost close to $100,000 with equipment.

Duro Metal Products Co., 2649 North Kildare Avenue, Chicago, is beginning superstructure for a one-story and basement addition, to cost about $50,000 with equipment.

American Gas Co., Newton, Iowa, D. C. Tenney, president, is completing plans for early construction of new artificial gas plant and system at Willmar, Minn., to cost about $200,000.

Iowa Foundry Co., West Second and Cook Streets, Sioux City, Iowa, has taken out permit for a one-story machine shop, 50 x 63 ft.

Municipal Utilities Co., Des Moines, Iowa, is negotiating with City Council, Missouri Valley, Iowa, for franchise for new steam-operated electric power plant and system, reported to cost $225,000 with equipment.

Brook Electrical Supply Co., Chicago, recently organized, has leased one-story and basement building, 50 x 116 ft., at 213-17 South Peoria Street, and will establish new plant for manufacture of electrical equipment; portion of works will be used for assembling.

City Council, Ottumwa, Iowa, is considering construction of power dam and hydroelectric power plant on Des Moines River, for municipal service, to cost in excess of $500,000. A transmission line will be built. Brown & Cook, 1008 North Market Street, are consulting engineers; J. T. Brady is city engineer.

Chicago & North Western Railway Co., Casper, Wyo., has plans for one-story repair shop, 50 x 148 ft., for tank car repair service, to cost close to $40,000 with equipment. General offices are at 148 South Clark Street, Chicago.

Cleveland

CLEVELAND, June 18.

WHILE the machine-tool market is spotty sales are holding up to the May volume. Recently demand was largely from the automotive industry, but now that field is inactive and business is mostly from other sources. Inquiry shows a little improvement, several new inquiries having come out for lots of three to six machines. The New York Central Railroad during the week purchased a turret lathe from a Cleveland dealer for one of its Indiana shops. A local manufacturer of turret lathes reports that its single tool orders are holding up well and that its deliveries on some types of machines have been extended into late July or August.

Lake City Malleable Co. is name of a new foundry company recently organized in Cleveland to operate foundry department of Chisholm-Moore Mfg. Co. When this company's chain block, electric hoist and crane division was taken over recently by Columbus-McKinnon Chain Co. and a subsidiary was formed under name of the Chisholm-Moore Hoist Corporation, a separate company was formed to operate foundry under name of Chisholm-Moore Malleable Iron Co. This name has now been changed to Lake City Malleable Co.

Construction of initial unit of a plant at Preston, Canada, to cost $150,000, has been authorized by directors of General Fireproofing Co., Youngstown, Ohio, company to be known as General Fireproofing Co. of Canada. Board of directors and officers of subsidiary will be Canadians. Products will be similar to those at Youngstown plant.

Interests in Standard Slag Co., Youngstown, have purchased buildings and equipment of plant formerly used by Youngstown Boiler & Tank Co., which is now occupying property on Oak Street purchased from United Engineering & Foundry Co., Pittsburgh.

Plans are being prepared by Eaton Axle & Spring Co., East 140th Street and New York Central Railroad, Cleveland, for one-story forge shop addition, 43 x 190 ft., to cost close to $50,000 with equipment. G. S. Rider Co., Century Building, is engineer.

Fisher Brass Co., Bellefontaine, Ohio, with branch plants at Marysville and Delaware, Ohio, is disposing of a stock issue to total $397,000, a portion of proceeds to be used for expansion. Company specializes in manufacture of plumbers' brass goods and has recently arranged for new factory branch and distributing plant on West Forty-ninth Street, New York.

Ohio Electric Power Co., Ravenna, Ohio, has plans for a new automatic power substation at its Mill Road plant, to cost close to $60,000 with equipment.

Hertner Electric Co., 1905 West 114th Street, Cleveland, manufacturer of electrical products, is having plans drawn for a new one-story plant, 100 x 240 ft., to cost about $70,000 with equipment. Paul S. Schmidt, 4500 Euclid Avenue, is engineer.

Osgood Co., Marion, Ohio, manufacturer of steam shovels, mining dredges, etc., has arranged for merger with Commercial Steel Castings Co., operating a local foundry, under first noted name. Consolidated company has capital of 125,000 shares of stock, no par value, and has arranged for bond issue of $1,400,000, a portion of proceeds to be used for expansion in plant facilities.

Officials of Darlington Fireproofing Co., Lisbon, Ohio, manufacturer of hollow tile and kindred building products, are reported interested in project for construction of new plant between Youngstown, Ohio, and Smiths Ferry, Pa., including power house, machine shop and other buildings, to cost $350,000.

Kelley Mfg. Co., Bucyrus, Ohio, manufacturer of caskets, vaults, etc., has begun superstructure for two-story addition, 75 x 150 ft., to cost about $60,000 with equipment.

American Aircraft Corporation, Massillon, Ohio, has been organized to manufacture airplanes. Plans are being made for building a plant and company will be in market for materials and equipment. Paul R. Stewart is general manager.

Cincinnati

CINCINNATI, June 18.

BUSINESS booked by machine-tool builders in the first half of June compares rather favorably with that during the last two weeks of May, although there has been a slight decline in volume of orders. Manufacturers are anticipating a falling off in buying as the summer season draws near and therefore have been fairly well satisfied with the rate at which users have been making purchases. Automobile companies have confined their participation in the market principally to miscellaneous tools for replacement, the only exception having been a sale to a Michigan maker of 12 automatic and special production lathes. Aside from an order from the Boston & Albany for one or two machines, railroad buying has been inactive. The Midvale Steel Co., Philadelphia, has contracted for a 30-in. x 28-ft. heavy-duty engine lathe. Sizable purchases of used tools by large industrial companies are causing comment locally.

Following recent merger of Chrysler Corporation and Dodge Brothers, Inc., Detroit, plans are said to be under consideration for new automobile assembling plant for both interests at Cincinnati, to cost more than $1,000,000 with equipment. Mason Towle is local representative for Dodge automobiles.

Board of Education, Cincinnati, is asking bids on general contract until June 25 for new two-story automotive trade school, to cost in excess of $100,000 with equipment. B. L. Baldwin, Second National Bank Building, is architect.

Department of Public Welfare, Ninth and Oak Streets, Columbus, Ohio, has plans under way for one-story power house, 100 x 105 ft., to cost close to $75,000 with equipment. It is also proposed to build an addition to brick-manufacturing plant at Roseville State prison, to cost more than $50,000 with machinery, for which plans will be prepared under direction of engineering department, Ohio State University, Columbus. J. E. Harper is director of department.

Dard Hunter's Paper Mill, Chillicothe, Ohio, has purchased former iron foundry of Barnum & Richardson Co., Lime Rock, Conn., and will remodel for new branch mill for manufacture of fine papers. Entire project is reported to cost more than $100,000. Dard Hunter is head.

Mid-Continent Petroleum Corporation, Hazel and Dumesnil Streets, Louisville, will rebuild portion of oil storage and distributing plant, including pumping station, destroyed by fire June 8, with loss reported in excess of $80,000 including equipment.

Kentucky Utilities Co., Starks Building, Louisville, has concluded negotiations for purchase of electric light and power properties of General Power & Light Co., Chicago, at Calhoun, Rumsey, Sebree, Ky., and vicinity, and plans extensions, including transmission line construction.

Knoxville Gas Co., Knoxville, Tenn., plans extensions and betterments in artificial gas works, including installation of purifiers, sulphur extractors and other equipment, to cost close to $40,000.

Ohio Fuel Gas Co., 99 North Front Street, Columbus, Ohio, is said to be planning a new two-story equipment storage and distributing plant, with service, repair and garage unit for company motor trucks and cars, to cost about $125,000 with equipment.

Brandeis Machinery & Supply Co., 325 West Main Street, Louisville, is planning a new one-story storage and distributing plant, to cost about $35,000 with equipment.

State Highway Department, Frankfort, Ky., is said to have concluded an arrangement with F. B. Drew, McAlester, Okla., and associates, for construction of a new cement mill in Kentucky, site soon to be selected, to cost $1,500,000 with equipment. Plant will have initial daily output of 4000 bbl. and State guarantees to use 75 per cent of production for a term of years. Robert W. Hunt, Robert W. Hunt Co., 175 West Jackson Boulevard, Chicago, engineer, is said to be interested in project. Kentucky Progress Commission, Frankfort, C. Frank Dunn, secretary, has information regarding enterprise.

Pittsburgh

PITTSBURGH, June 18.

THE first half of the month has been marked by only moderate activity in machinery and tools. A fairly good sprinkling of orders against inquiries which originated some time ago is reported by some houses, but more commonly the report is that both sales and inquiries are few.

Youngstown Sheet & Tube Corporation, Youngstown, Ohio, has plans under way for a new coal-washing plant, with mining and distributing facilities at its properties at Nemacolin, Pa., to cost in excess of $750,000. Allen & Garcia, 322 South Michigan Avenue, Chicago, are consulting engineers.

American Zinc & Chemical Co., Clark Building, Pittsburgh, has awarded general contract to Rust Engineering Co., American State Bank Building, for one and two-story and basement addition to mill at Langeloth, Pa., to cost more than $300,000 with equipment.

Swissvale School Board, Swissvale, Pa., is asking bids until July 2 for woven wire fence for Newmyer school property, Hampton Avenue and St. Lawrence Street. Ida E. Wallace, secretary.

Allegheny County Steam Heating Co., 435 Sixth Avenue, Pittsburgh, is said to be planning establishment of new power operating unit, to cost in excess of $350,000 with equipment.

G. P. Fryling, St. Mary's, Pa., and G. G. Herrick, Erie, Pa., have organized Erie Resistor Corporation, with capital of $25,000, to operate plant at Erie for manufacture of electrical products for resistance service, including copper, brass, carbon and other specialties. G. Richard Fryling, St. Mary's, is also interested in new company.

A. L. Confer, Oil City, Pa., an official of Empire Oil Works, Inc., Oil City, and associates have purchased controlling interest in Tidioute Refining Co., Tidioute, Pa., and will assume active management of oil properties and refinery. Plans are under way for expansion.

Homestead Valve Mfg. Co., Sixth Avenue, Homestead, Pa., plans early call for bids on general contract for one-story addition to foundry, including improvements in present plant, to cost in excess of $40,000 with equipment.

Septic Tank Engineering Co., 1224 Seventh Avenue, Beaver Falls, Pa., has been incorporated with capital stock of $25,000 to manufacture "Black Ball" septic tanks made of Copperoid steel. Most of work will be done on contract. G. A. P. Bowman is president.

Detroit

DETROIT, June 18.

PLANS have been authorized by Fisher Body Corporation, General Motors Building, Detroit, for a one-story addition to plant at Saginaw, Mich., 400 x 460 ft., to cost in excess of $1,500,000 with equipment.

Officials of Ottawa Furniture Co., Holland, Mich., have organized as Chippewa Cabinet Co., a subsidiary, to take over local plant of American Cabinet Co., under lease. New company will specialize in production of radio cabinets and kindred products.

Packard Motor Car Co., 1580 East Grand Boulevard, Detroit, has plans for new one-story foundry, to cost in excess of $100,000 with equipment. Albert Kahn, Inc., Marquette Building, is architect and engineer.

Universal Products Co., Inc., Kingsley Avenue, Detroit, manufacturer of universal joints for automobiles, etc., is disposing of a stock issue to total $1,170,000, a portion of fund to be used for expansion and improvements.

Leadingbrand, Inc., Lansing, Mich., recently organized by S. E. Liedabrand, Lansing, and associates, has leased local factory space and plans early operation for manufacture of new types of pumps, water softeners, and kindred products.

Board of Education, Pontiac, Mich., is planning early call for bids on general contract for three-story industrial arts school on Central High School campus, to cost $120,000, for which plans are being drawn by Childs & Smith, 720 North Michigan Avenue, Chicago, architects.

Briggs Mfg. Co., 11631 Mack Avenue, Detroit, manufacturer of automobile bodies, has acquired property on East Warren Avenue, as site for five-story addition for metal body stampings, to cost in excess of $500,000 with equipment.

Fruehoff Trailer Co., Harper Avenue, Detroit, has asked bids on general contract for one-story addition, 100 x 150 ft., to cost more than $65,000 including equipment. It will be used largely for assembling automobile truck trailers. H. P. Stihler, 2931 Gray Avenue, is architect.

Victor Body Co., Lansing, Mich, is moving equipment from plants at Grand Rapids and Iona, Mich., to its local factory and plans early production of bodies for Reo Motor Car Co. Initial output will be given over primarily to commercial bodies, with intentions of developing manufacture of passenger car bodies later.

Central States Utilities Co., Monroe, Mich., has arranged an expansion and improvement program for artificial gas plants, including additional equipment for increased generating and storage capacities, to cost more than $85,000.

Hercules Forging Co., recently organized, has purchased plant and equipment of Cadillac Forged Products Co., 2962 Hart Avenue, Detroit, and will continue business with little or no change in office or shop personnel. J. J. Callahan, president and treasurer of new company, is also president and treasurer of General Tool & Engineering Co., Detroit. Transfer was made possible by settling of estate of late Louis J. Kraus, head of Cadillac Forged Products Co., who died May 3.

Keeler Brass Co., Grand Rapids, Mich., has succeeded to business of Pleasant Valley Brass Co. Officers of Keeler company are Miner S. Keeler, president; Isaac S. Keeler, vice-president; C. Norman Webb, secretary, and George E. Keeler, treasurer.

St. Louis

ST. LOUIS, June 18.

WORK will soon be started by St. Louis Smelting & Refining Co., International Life Building, St. Louis, on new mill at Quapaw, Okla., to cost close to $200,000 with machinery. Company is operating on Ballard lease, near Quapaw.

Polar Wave Ice & Fuel Co., 3638 Olive Street, Kansas City, Mo., has plans for new ice-manufacturing plant to cost more than $55,000 with equipment.

Samples Mining Co., McAlester, Okla., operating coal mines on property of Oklahoma State Penitentiary, plans rebuilding portion of tipple destroyed by fire June 11, with loss close to $25,000.

Linde Air Products Co., 30 East Forty-second Street, New York, has acquired property at Oklahoma City, Okla., and contemplates new branch plant to cost close to $45,000 with equipment.

Consolidated Gas Utilities Co., Blackwell, Okla., recently formed to take over and consolidate Blackwell Pipe Line Co., Midwest Gas Co., Oklahoma Northern Gas Co., and other natural gas properties, is disposing of stock issue to total $3,534,000, a portion of proceeds to be used for expansion and improvements, including pipe line construction.

Board of Managers, Missouri School for Deaf, Fulton, Mo., Herbert E. Day, superintendent, has asked bids on general contract for new manual training building, to cost in excess of $75,000 with equipment. Charles A. Smith, Finance Building, Kansas City, Mo., is architect.

Gilman Granite Co., 1302 Elmwood Avenue, Kansas City, Mo., will make extensions and betterments in plant at Fairfax Industrial District, to include new power house, 20 x 24 ft., and crane runway, 50 x 110 ft., to cost about $45,000 with equipment.

H. L. Skettler, South Arch Street, Tulsa, Okla., contractor, will soon begin work on one-story automobile service, repair and garage building, 87 x 200 ft., to cost close to $90,000 with equipment.

Citizens' Electric Co., Hot Springs National Park, Ark., has plans for extensions and improvements in local power house, to cost in excess of $75,000 with equipment. Boilers, pumping machinery, oil-burners, feed regulators and accessory equipment will be installed. S. E. Dillon is general manager.

Hillyard Chemical Co., 801 South Ninth Street, St. Joseph, Mo., has revised plans for new three-story plant, to cost close to $100,000 with equipment. Eugene Meier, Lincoln Building, is architect.

Scullin Steel Co., which has been located at 6700 Manchester Avenue, St. Louis, has changed its address to Security Building, Fourth and Locust Streets, St. Louis.

Stiles-Herman Mfg. Co., 1710 Russell Boulevard, St. Louis, has been incorporated to manufacture fender rollers for taking dents out of automobile fenders. Manufacturing will be done on contract. J. C. Stiles is president.

Indiana

INDIANAPOLIS, June 18.

GENERAL contract has been let by Perfection Windshield Co., 1340 North Capitol Avenue, Indianapolis, manufacturer of automobile windshields, to John R. Curry Construction Co., Empire Life Building, for new one-story and basement plant, 50 x 150 ft., to cost about $23,000 with equipment.

Ontario Mfg. Co., Muncie, manufacturer of cutlery, plated flat ware, etc., is disposing of a preferred stock issue of $600,000, a portion of fund to be used for expansion and improvements.

Connersville Cabinet Co., Connersville, Ind., recently organized, will take over portion of former local factory of Connersville Furniture Co., and will remodel for new plant to manufacture cabinets, cedar chests and kindred products. J. E. Meyer, Richmond, Ind., is one of heads of company.

Perry Township School Board, Southport, Ind., is said to be planning installation of manual training equipment in new two-story high school to cost $180,000, for which plans will be drawn by McGuire & Shook, 941 North Meridian Street, Indianapolis, architects.

City Council, Lebanon, is considering early establishment of municipal airport, with construction of hangars, repair shops, oil storage and distributing building, etc.

Board of Education, Kokomo, is considering installation of manual training equipment in new high school to cost $170,000, for which bids will soon be asked on general contract. H. B. Bartlett, 1050 North Delaware Avenue, Indianapolis, is architect.

Electric Shovel Coal Corporation, Clinton, has purchased properties of Ayershire Coal Co., Winslow, Ind., and will convert from shaft mining to stripping operations. Electric shovels and other machinery will be installed and steel tipple built. Company recently disposed of stock issue of $2,900,000, a portion of fund to be used for expansion.

Milwaukee

MILWAUKEE, June 18.

MODERATE activity prevails in the machine-tool market, with new business being booked relatively satisfactory. Employment reports state that the heaviest demand for labor comes from the metal and building trades. Several large shops manufacturing automotive units, parts and equipment are maintaining three 8-hour shifts.

Following consolidation of the Northwestern Malleable Iron Co., 756 Park Street, Milwaukee, with Rockford Malleable Iron Co., Rockford, Ill., as Rockford Northwestern Malleable Iron Co., Milwaukee foundry and its 8-acre site have been sold to International Harvester Co., the two sites being adjacent. No definite plans have been made for use of the property. International company has recently started work on a new steam generating plant costing about $500,000 and contemplates erection of a large unit for tractor division and later an addition to cream separator division. Equipment of Northwestern plant is being transferred to Rockford.

Beloit Pattern Works, Beloit, Wis., is establishing a branch plant at 1350 Burnham Street, Milwaukee, where a building with 12,000 sq. ft. has been acquired. H. W. Price will be manager.

Briggs & Stratton Corporation, 1047 Thirteenth Street, Milwaukee, manufacturer of electrical units, parts and accessories for automotive industries, has purchased controlling interest in Evinrude Motor Co., Twenty-seventh Street and Capitol Drive, Milwaukee. It is stated that two plants will be kept in operation under present managements. Stephen F. Briggs is president of Briggs & Stratton company, and August J. Petrie, president of Evinrude company. Briggs & Stratton company is adding a tenth story to its present building, 60 x 120 ft., to enlarge its own operation.

Milwaukee Department of Public Works, R. E. Stoelting, commissioner, is asking bids until June 29 for construction of a fire department repair shop for manufacture of motor fire apparatus and its maintenance. Investment in building and equipment will be about $250,000. Bids on tools and other machinery will be requested later.

Highway Trailer Co., Edgerton, Wis., manufacturer of trailers, dump bodies, etc., has increased its capital stock to $1,000,000, following consolidation with its subsidiary, Continental Axle Co., Edgerton. Entire output of axle company is absorbed by Highway company. Enlargement of both plants, which adjoin, has been going on for past year and equipment purchases are being made from time to time. James W. Menhall is president.

W. H. Martin, 5430 State Street, Milwaukee, will build a general machine and repair shop, 54 x 60 ft., at 5426-5428 State Street.

Invincible Metal Furniture Co., Twenty-sixth and Franklin Streets, Manitowoc, Wis., is establishing an aircraft division and will invest about $200,000 in building and equipment. Contracts have been placed for erection of a one-story brick and steel factory, 86 x 335 ft., adjacent to present plant. Architect is William J. Raeuber, local. J. A. Schuette is president.

Racine Screw Works, 1501 Clark Street, Racine, Wis., will proceed with construction and equipment of a new plant to replace shop wrecked by fire on Feb. 25. J. P. Welling & Co., 737 Elaine Boulevard, local, have contract to erect building, 120 ft. sq., one-story and part basement. New automatic screw machine equipment is being purchased.

Board of Public Works, Waukesha, Wis., has extended from June 11 to June 27 time of closing bids for construction and equipment of a municipal sewage disposal plant and pumping station to cost $190,000. A. R. Schuh is city engineer.

Atlas Engineering Co., Milwaukee, has completed removal of its plant and equipment to Clintonville, Wis., where it is occupying enlarged factory of Topp-Stewart Tractor Co., with which it recently was consolidated. Atlas company manufacture concrete mixers, wagon loaders, conveyors, etc., and will continue manufacture of the Topp-Stewart tractor, which is of quadruple drive type. C. W. Zimmerman is vice-president and manager.

Unit Corporation of America, Milwaukee, which has been operating its gear division 24 hr. a day for several weeks, is preparing to place its forging division, formerly known as the Obenberger Forge Co., on a similar schedule. Fuller transmission works, Kalamazoo, Mich., another division, is to start operating day and night on July 1 for at least one month and possibly several months, according to W. H. Schmidt, president and general manager.

Blair Foundry Co., 364 North Broadway, Waukesha, Wis., has been succeeded by Pioneer Foundry Co., which will continue manufacture of same line of products.

Gulf States

BIRMINGHAM, June 18.

ARRANGEMENTS have been completed by International Paper Co., 100 East Forty-second Street, New York, for purchase of plant and property of Southern Paper Co., Moss Point, Miss., comprising a recently completed pulp and kraft paper mill, for about $4,200,000. New owner will continue operations as branch mill and plans to carry out expansion program later. Purchasing company will make improvements in its mills at Camden, Ark., including installation of lime sludge disposal plant to cost close to $80,000.

Reed Roller Bit Co., Mack Street and Avenue Q, Houston, Tex., has awarded general contract to Houston Structural Steel Co., 3910 Washington Street, for one-story machine shop, 75 x 100 ft., sawtooth roof type, to cost about $24,000 with equipment.

J. A. Taylor, 2332 Indiana Street, Houston, Tex., engineer, has plans for two-story cold storage and refrigerating plant at Brownsville, Tex., 100 x 240 ft., to cost in excess of $200,000 with machinery. It will be increased to three stories later.

Southeastern Power & Light Co., Birmingham, operating Alabama Power Co., Georgia Railway & Power Co., Mississippi Power Co., and other utilities, has arranged for increase in capital from 7,000,000 to 8,000,000 shares of stock, a portion of proceeds to be used for expansion and improvements, including transmission line construction, totaling about 100 miles in different parts of State. Company has acquired plant and property of Mill Port Gin, Ice & Power Co., Mill Port, Tex., and plans expansion in that district.

Fisk Rubber Co., Chicopee Falls, Mass., manufacturer of automobile tires, has leased a two-story building to be erected on North Carrollton Avenue, New Orleans, for a new factory branch, storage and distributing plant, for Louisiana, Texas, Mississippi and Arkansas, to cost in excess of $125,000 with equipment.

City Council, Alabama City, Ala., has authorized plans for a new pumping plant for municipal waterworks, to cost $70,000 with equipment. A bond issue is being arranged.

United Producers Pipe Line Co., a subsidiary of Transcontinental Oil Co., Tulsa, Okla., and Fort Worth, Tex.,

is planning early construction of 10-in. pipe line from Cushing, Okla., to McCamey, Tex., in west Texas oilfields, 433 miles, to cost more than $2,000,000 with compressor stations, etc.

Louisville & Nashville Railroad Co., Louisville, has plans for new locomotive and car shops at Mobile, Ala., comprising engine house, machine shop, forge and blacksmith shop, boiler house and other units. Company will also construct new 12-track terminal yard at same place, with turntable, coaling station and other facilities. Entire project is reported to cost more than $400,000 with equipment. W. H. Courtenay is chief engineer.

Phillips Petroleum Co., Bartlesville, Okla., has plans for extensions and improvements in gasoline refinery at Pampa, Tex., to cost close to $100,000 with equipment. It is also planning construction of new gasoline refinery in Rock Creek district, Hutchinson County, Tex., to cost approximately $130,000 with machinery.

Southern Cities Supply Corporation, Bankers' Bond Building, Birmingham, has acquired property adjoining its brick-manufacturing plants at Fox Station, about 30 miles from city, and plans expansion and installation of additional equipment for clay mining, conveying, brick manufacture, etc., to cost in excess of $90,000. Company has acquired barge fleet now operating on Warrior River, and will operate in conjunction with brick plant. Arrangements have been made for sale of 300,000 shares of stock, considerable portion of fund to be used for expansion.

South Coast Co., 645 North Michigan Boulevard, Chicago, has approved plans for construction of new cane sugar refinery at Oaklawn plantation, St. Mary Parish, La., to cost in excess of $750,000 with machinery. Contracts for portion of machinery have been let and other awards will soon be placed. A 20-ton traveling crane will be installed.

Atchison, Topeka & Santa Fe Railway Co., Fort Worth, Tex., plans construction of locomotive shops in connection with new switching yards at Saginaw, near Fort Worth. Yards will have capacity for handling 2000 cars and will cost close to $1,000,000 with shop facilities. Main locomotive repair shops for this district will be continued at Cleburne, Tex., where an expansion and improvement program is now in progress, to cost more than $1,500,000 for new buildings and machinery.

Warren, Knight & Davis, Empire Building, Birmingham, architects, have plans for one-story automobile service, repair and garage building, 75 x 145 ft., to cost more than $75,000 with equipment.

Moran Corporation, Slattery Building, Shreveport, La., is planning construction of several artificial gas plants and will be in market soon for equipment, including boiler and power facilities.

San Antonio Portland Cement Co., San Antonio, Tex., plans early construction of addition to power house at Lakeview. Other structures will be built, including raw mill unit, 65 x 150 ft. Entire project will cost in excess of $100,000. W. E. Simpson, National Bank of Commerce Building, is engineer.

Pacific Coast

SAN FRANCISCO, June 13.

PLANS are under way for one-story addition to plant of Lockheed Aircraft Co., Burbank, Cal., 50 x 200 ft., to cost close to $50,000 with equipment.

Union High School District, Tustin, Cal., has plans for one-story manual training shop addition at local high school to cost about $25,000. Mott M. Marston, Douglas Building, Los Angeles, is architect.

William Fox Film Co., 1401 North Western Avenue, Los Angeles, has plans for a one-story machine shop at motion picture plant, 62 x 75 ft., in conjunction with new laboratory unit, 75 x 145 ft., to cost about $85,000 with equipment. William Darling is company architect.

Elbridge Smith, secretary, West Stanislaus Irrigation District, Westley, Cal., is asking bids until July 14 for 17 electrically-operated pumping units, 11 discharge pipes and valves for future pumps, 18 transformers and six electric switching stations, outdoor type. W. F. Woolley, Patterson, Cal., is chief engineer for district.

Astoria Box & Paper Co., Astoria, Ore., has acquired property from city, adjoining present mill, and is reported planning construction of new pulp mill unit, to cost in excess of $250,000 with machinery.

K. Lane Johnson, Holtzinger Building, Yakima, Wash., and associates have plans for a new two-story and basement cold storage and refrigerating plant, 80 x 135 ft., at Prosser, Wash., to cost about $45,000 with equipment.

City Council, Ellensburg, Wash., has authorized bond issue for $35,000 for extensions and improvements in municipal electric light and power plant, including installation of additional equipment.

Seattle Pulp & Paper Mills, Inc., Seattle, care of Tom G. Taylor & Co., Dexter-Horton Building, recently organized by officials of last noted company and associates, has plans for new pulp and paper mill on 20-acre tract on Duwamish River, near Seattle, to include power house, machine shop and auxiliary structures, to cost in excess of $1,000,000 with machinery. Joseph Irving, head of Crescent Logging Co., Everett, Wash., is president; Allen B. Engle of Taylor company, noted, is secretary.

Pacific Gas & Electric Co., 245 Market Street, San Francisco, has authorized a new automatic power substation at San Jose, Cal., to cost $278,000, and has appropriated funds in that amount. J. D. Kuster is division manager at San Jose.

J. C. Palumbo Fruit Co., Payette, Idaho, has plans for a four-story and basement cold storage and refrigerating plant, to cost upward of $60,000 with equipment. Tourtellotte & Hummel, Boise, Idaho, are architects.

Great Western Power Co., 530 Bush Street, San Francisco, will soon break ground for new steam-operated electric power house on San Francisco Bay, South San Francisco, to cost more than $3,000,000 with transmission system. Additional units will be added later. Company is subsidiary of North American Co., Cleveland.

Foreign

A FUND of about 170,391,000 yen ($85,195,500) will be expended by Japanese Government Railways, Tokyo, during present year for expansion and improvement of operating facilities, including additional repair and reconditioning shops, replacing of light rails with heavier sections, electrification on several lines, rolling stock, etc. An appropriation of 51,560,000 yen ($25,780,000) will be used during this same period for construction of new railroad lines. American Consulate, Tokyo, J. H. Ehlers, assistant commercial attaché, has information regarding work.

Piedmont Hydro-Electric Co. (Societa Idroelettrica Piemonte), Turin, Italy, is disposing of a note issue in United States totaling $4,000,000, a portion of proceeds to be used for expansion and betterments, including construction and acquisition of new hydroelectric generating plants, power substations and transmission lines, etc.

International Petroleum Corporation, Ltd., 120 Broadway, New York, a subsidiary of Standard Oil Co. of New Jersey, 26 Broadway, is concluding arrangements with Government of Republic of Colombia, where company operates concessions, for authority to arrange for loan of about $200,000,000, a considerable portion of fund to be used for development of oil properties, storage and distributing facilities, etc., in Colombia fields. Operations are carried out in name of Tropical Oil Co., an affiliated organization.

Plans are under way for a consolidation of tire and rubber manufacturers in Germany, including Continental Rubber Co., Hanover; German Dunlop Co., Hanau; Excelsior Rubber Works, Ltd., Hanover; Peters Union Rubber Works, Frankfort; and Harzburger Rubber Factory, Phoenix. Amalgamated company plans to carry out expansion and improvement program, with increased production facilities.

Gesellschaft fur elektrische Unternehmungen, known as "Gesfurel" (Corporation for Electrical Enterprises), Berlin, Germany, is disposing of a bond issue of $5,000,000 in United States, a portion of fund to be used for extensions and improvements in electric generating and transmission line properties in Germany and other European countries.

American Smelting & Refining Co., 120 Broadway, New York, is said to be arranging for work on new refinery

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at Monterrey, Mexico, in connection with present lead smelting works at that point, for which authorization recently was granted by Mexican Government; smelter has a capacity of 10,000 tons per month and new refinery will have equipment to handle this output. It is reported to cost more than $1,000,000.

Canada

TORONTO, June 18.

BUSINESS the past week has consisted mostly of scattered orders for one or two tools. The automotive industry is buying for replacement needs, and two or three companies have lists in preparation for new works proposed or under construction. A large part of the orders recently closed were from the mining district of northern Ontario.

It is reported that Richardson Terminal Elevator & Grain Co., Port Arthur, Ont., is planning erection of elevator to have a capacity of 20,000,000 bu.

H. A. Brown, vice-president and general manager of General Motors of Canada, Ltd., Oshawa, Ont., has announced plans for an addition to company's plant at Windsor, Ont., for production of cab and car bodies.

E. G. M. Cape Co., 10 Cathcart Street, Montreal, has let a number of sub-trades in connection with an addition to plant of Simmons, Ltd., 400 St. Ambroise Street, Montreal, to cost $250,000. Architects are Ross & MacDonald, 1 Belmont Street.

N. O. Hipel, Ltd., Guelph Street, Preston, Ont., is making arrangements for the erection of a manufacturing plant there.

Bulk tenders are being received by J. R. W. Ambrose, chief engineer, Toronto Terminal Railways, New Union Station, Toronto, until June 26, for construction of a central power plant, 65 x 200 ft., to be erected by Canadian National and Canadian Pacific railroads, at a cost of $1,000,000.

Western Canada

General Motors of Canada, Ltd., Oshawa, Ont., will start work at once on erection of a $1,000,000 manufacturing and assembly plant at Regina, Sask. Hutton & Souter, Hamilton, Ont., are architects. Main building will be 400 x 800 ft.; office building, three-stories, 50 x 200 ft.; and power house 80 x 80 ft. It is expected to have plant ready for operation not later than Dec. 1.

Crow's Nest Pass Coal Co., Ltd., Fernie, B. C., has awarded Vancouver Machinery Depot, Ltd., Vancouver, B. C., contract for three Belliss & Morcom compound vertical-type, high-speed air compressors, with three 600-hp. Canadian General Electric synchronous motors. Canadian Ingersoll-Rand Co., Shgrbrooke, Que., was awarded contract for one 1200-cu. ft. horizontal type, high-pressure machine.

New Trade Publications

Gasoline-Operated Locomotive Crane.—Orton Crane & Shovel Co., 608 South Dearborn Street, Chicago. Bulletin 56 of 16 pages and a 4-page folder illustrate and describe a line of locomotive cranes running up to 40-ton capacity. Turn tables give full swing around a circle. The folder is devoted to such cranes operated by one man, and rating up to 25 tons.

Installing Oil Heat.—Oil Heating Institute, 420 Madison Avenue, New York. Booklet of 36 pages detailing methods of installing heating equipment from the point of view of the architect. Nearly 20 types are illustrated in detail, in addition to 6 pages of general information regarding the equipment and its use. While the pamphlet is devoted primarily to residence units, practically all of these units are made in sizes suitable for industrial use.

Master Regulators.—Hagan Corporation, Pittsburgh. Bulletin 101 of 16 pages deals with apparatus developed for combustion control in steam boilers. It is illustrated with both halftones and line cuts, showing details of the equipment and installations.

Two-Cycle Diesel Engine.—Busch-Sulzer Brothers-Diesel Engine Co., St. Louis. Catalog of 16 pages featuring the type-E Diesel engine of high speed, light weight and compact design. These engines have been used in United States Navy submarines and for other marine equipment, and are used also for power plant purposes, particularly as stand-bys. They range from three to eight cylinders. The commercial type weighs about 100 lb. to the horsepower, compared with 55 lb. for the submarine type.

THE LAST WORD

(Contributed by the Reader Service Department of The Iron Age Publishing Co.)

This here younger generation! Tck! Tck!

"I was being given a sales talk on the merits of a certain brand of penetrating oil," writes de la Haye from Philadelphia, and was told that it was especially effective in promoting the "*osculation* of the wrist pins."

And we didn't even know he was sick

From the New York *Sun*, June 3, 1928:

Grave of Iron Age Chief Is Discovered

ROENNE, Island of Borholm (A. P.)—The elaborately furnished grave of a Burgundian chieftain of the iron age was discovered on the island and identified by the National Museum of Copenhagen as a relic of the third century.

In the grave were two earthen vessels containing food for the long journey into the beyond.

"GRANDPA, what did you do in the great war and why didn't you have sense enough to get into the aircraft industry when it was in its infancy?" they will be asking us accusingly, forty years hence.

We shall be able to tell how we bravely stood guard over the wine vats in the Bordeaux section, but the aircraft part of the question will be harder to handle. We have a hunch it will be something like this:

"Children, back in the late 'twenties I can recall that there were as many as 113 aircraft builders. How many are there now? Less than 30, and that huge General Aircraft Co., with the slogan, 'a plane for every purse,' is getting most of the business. Instead of blaming your grandpop for lack of foresight, you ought to be grateful I kept my money in the old automobile business, for there were more that lost than won in the pioneer days of the airplane industry." Out of 190 makes of automobiles, there are now only about 50 left.

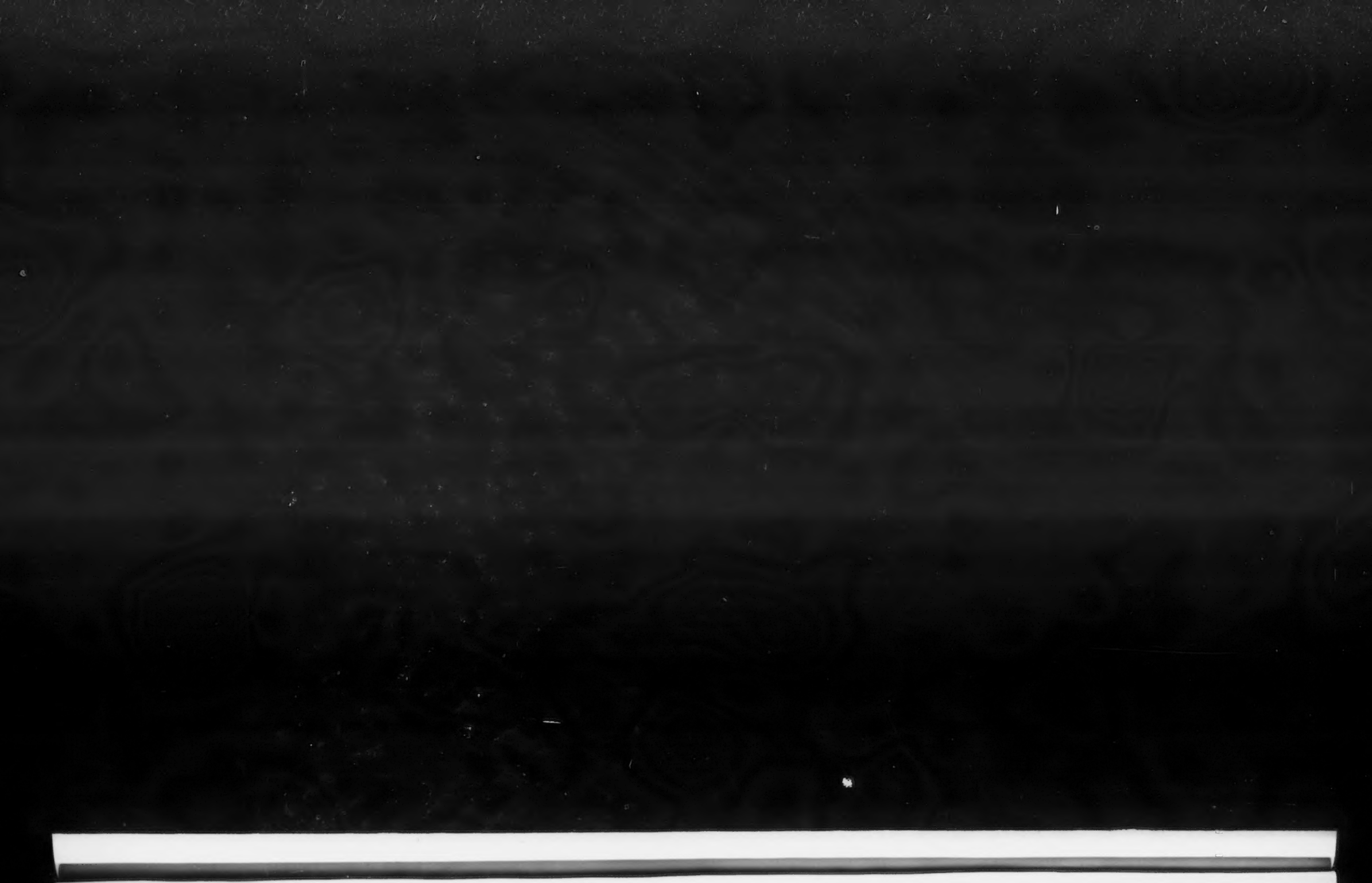
AN open letter to Messrs. Fairbairn, Wingfield & Wykes, chartered accountants, tel. address "Thriftily," 67 Watling Street, London, attention Mr. A. Dodds Fairbairn:

Dear Dodds:

Thanks for notifying us that the crash of our former subscriber, Williams & Norgate, Ltd., does not leave us entirely bereft, and that we have a certain sum coming to us on the unpaid subscription.

To obtain this sum we must call at your office on Watling Street any day between the hours of 10 and 1 (except Saturday). We are booked solid with luncheon engagements for the next three weeks, and so can not get around your way. Besides, we dislike that Watling Street traffic.

Therefore, we commission you to take the "blank pounds, blank shillings, and eight pence" due us and buy us a Dunhill pipe, which we understand can be purchased at reduced rates in your neighborhood. Thanks, Dodds. You can give me the pipe the next time you are over. Best regards to Doug Wykes and Ernie Wingfield.

"Have you had your copper today?" physicians are now asking, for it is reported that copper in the diet cures rickets, anemia and fallen arches. But if you have any of these ailments and find that swallowing pennies does not effect a cure, don't complain to us. For we have a suspicion that it is only some more propaganda put out by the copper interests, with the intention of crowding iron to the background.

Will this attempt to displace iron from its rightful position in medicine extend also to metaphor? Maybe our great-grandchildren will read, "He failed because he had too many coppers in the fire," or "He was a man of copper-silicon will." And the beauteous heroine will sob to her obdurate husband, "Why do you copper your heart against me?" A. H. D.